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(71) Applicant: **Huang, Huaze**
Fuzhou, Fujian 350000 (CN)

(72) Inventor: **Huang, Huaze**
Fuzhou, Fujian 350000 (CN)

(74) Representative: **Bayramoglu et al.**
Mira Office
Kanuni Sultan Süleyman Boulevard 5387
Street Beytepe, floor 12, no:50
06800 Cankaya, Ankara (TR)

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(54) **SIZE-ADJUSTABLE STORAGE BOX AND BIDIRECTIONAL COLLAPSIBLE ASSEMBLY PLATE**

(57) A resizable storage box includes a box body with an accommodating space formed by a side wall (1) and at least one bottom plate (3) that are connected, where the side wall includes four bidirectional retractable plate assemblies (1-1); each of the bidirectional retractable plate assemblies (1-1) includes a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection; and respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate

(1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12). A bidirectional retractable plate assembly for the storage box includes a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection. The storage box can be adjusted in size in three directions, can be retracted and extended to be folded, and can also adapt to the packaging or storage of items of different sizes through self-adjustment.

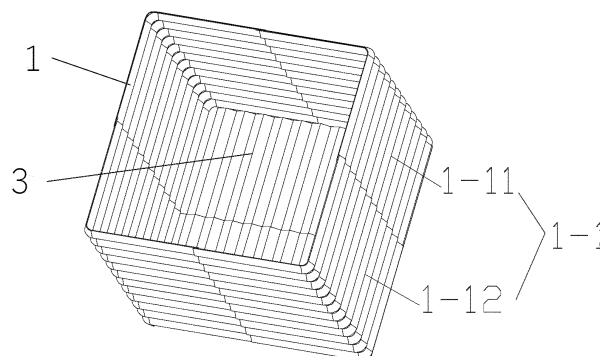


FIG. 1

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of storage boxes, and in particular to a resizable storage box.

BACKGROUND TECHNOLOGY

[0002] A storage box is a kind of box used to summarize and organize idle items in daily life. According to the preparation material, the storage box can be classified into a plastic storage box, a wooden storage box or a canvas storage box. The plastic storage box and the wooden storage box are usually fixed structures, and cannot be folded when there are few idle items in life and no need to use the storage box for storage. Although the canvas storage box can be folded, there is no retractable fixed frame member inside. The canvas storage box just adopts a simple fiber cloth bag with a simple overall design. After being folded for a long time, the canvas storage box will easily deform, which will affect its reuse. At the same time, as today's social life has entered the Internet era, the prevalence of online shopping has led to a large increase in logistics express delivery, and accordingly the use of packaging and storage boxes used in logistics has also increased accordingly. Traditional storage boxes used for logistics packaging are mass-produced according to fixed specifications. However, the actual size of items that the general public needs to store is not fixed, so there is often a mismatch between the storage box and the items. This hinders the smooth packaging and safe transportation of the items, and causes a significant unnecessary waste of box materials.

CONTENT OF THE INVENTION

[0003] An objective of the present disclosure is, in view of the above shortcomings, to provide a storage box that can freely adjust its size in three directions. When the storage box is not needed for storing an item, it is folded to save storage space. When the storage box is needed for storing an item, it is unfolded, and its size can be freely adjusted in three directions according to the size of the item, making it flexible and convenient to use.

[0004] In order to solve the above technical problems, the present disclosure adopts the following technical solution:

A resizable storage box includes a box body with an accommodating space formed by a side wall (1) and at least one bottom plate (3) that are connected, where the side wall includes four bidirectional retractable plate assemblies (1-1); and each of the bidirectional retractable plate assemblies (1-1) includes a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection; and respective

retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0005] Further, each of the bidirectional retractable plate assemblies (1-1) further includes a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0006] Further, each of the bidirectional retractable plate assemblies (1-1) further includes a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection, and a third lateral retractable plate (1-23) and a fourth lateral retractable plate (1-24) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at an upper side; the third lateral retractable plate (1-23) and the fourth lateral retractable plate (1-24) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a lower side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) and a sliding direction of the third lateral retractable plate (1-23) relative to the fourth lateral retractable plate (1-24) are identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0007] Further, each of the bidirectional retractable plate assemblies (1-1) further includes combined retractable edge plates (2-1) respectively located at two straight sides of the four-directional retractable assembly (1-1); each of the combined retractable edge plates (2-1) includes a first fixed edge plate (2-11) connected to the first lateral corrugated plate (1-11), a second fixed edge plate (2-12) connected to the second lateral corrugated plate (1-12), and a corrugated edge plate (2-13) provided between the first fixed edge plate (2-11) and the second fixed edge plate (2-12); and retraction and extension directions of the corrugated edge plate (2-13) are perpendicular to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0008] Further, the bottom plate (3) includes a bottom four-directional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) includes a first bottom corrugated plate (3-11) and a second bottom

corrugated plate (3-12) that are in the slidable sleeve connection; and respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0009] Further, the bottom plate (3) further includes a first bottom retractable plate (3-21) and a second bottom retractable plate (3-22) that are in the slidable sleeve connection; the first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a same side; and a sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) is identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0010] Further, the bottom plate (3) further includes a first bottom retractable plate (3-21) and a second bottom retractable plate (3-22) that are in the slidable sleeve connection, and a third bottom retractable plate (3-23) and a fourth bottom retractable plate (3-24) that are in the slidable sleeve connection; the first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at an upper side; the third bottom retractable plate (3-23) and the fourth bottom retractable plate (3-24) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a lower side; and a sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) and a sliding direction of the third bottom retractable plate (3-23) relative to the fourth bottom retractable plate (3-24) are identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0011] Further, the bottom plate (3) further includes combined retractable edge plates (3-31) respectively located at two straight sides of the four-directional retractable assembly (3-1); each of the combined retractable edge plates (3-31) includes a first bottom fixed edge plate (3-311) connected to the first bottom corrugated plate (3-11), a second bottom fixed edge plate (3-312) connected to the second bottom corrugated plate (3-12), and a bottom corrugated edge plate (3-313) provided between the first bottom fixed edge plate (3-311) and the second bottom fixed edge plate (3-312); and retraction and extension directions of the bottom corrugated edge plate (3-313) are perpendicular to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0012] Further, the bottom plate (3) includes two bottom retractable plate assemblies (3-41) that are in the slidable sleeve connection; each of the bottom retract-

able plate assemblies (3-41) includes a first bottom flat plate (3-411) and a second bottom flat plate (3-412) that are in the slidable sleeve connection; and slidable retraction and extension directions of the two bottom retractable plate assemblies (3-41) are perpendicular to a sliding direction of the first bottom flat plate (3-411) relative to the second bottom flat plate (3-412).

[0013] Further, the bottom plate (3) includes a bottom four-directional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) includes four bottom base plates (3-51) that have a folded state or an unfolded state; and each of the bottom base plates (3-51) is connected to a bottom of a lateral retractable assembly located at a corresponding position.

[0014] Further, the bottom plate (3) includes a bottom four-directional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) includes a hollow structure surrounded by four side frames (3-61) connected end to end; at least one sliding rod (3-62) is provided at a hollow position to form an enclosure and is slidable relative to the side frames (3-61); when the sliding rods (3-62) are slid, a spacing between two adjacent sliding rods (3-62) is adjustable to adapt to items of different sizes; each of the side frames (3-61) at least includes a first side frame member (3-611) and a second side frame member (3-612) that are in a slidable connection; the first side frame member (3-611) and the second side frame member (3-612) are slidable relative to each other in a length direction to make the side frame (3-61) resizable; each of the sliding rods (3-62) at least includes a first rod member (3-621) and a second rod member (3-622) that are in a slidable connection; and the first rod member (3-621) and the second rod member (3-622) are slidable relative to each other in a length direction to adapt to a change in the side frame (3-61).

[0015] Further, a hinged, magnetic suction, or buckle structure is provided to form a connection between the bidirectional retractable plate assemblies (1-1), as well as between the bidirectional retractable plate assembly (1-1) and the bottom plate (3).

[0016] Further, the hinged structure includes: hinges provided between the bidirectional retractable plate assemblies (1-1) as well as between the bidirectional retractable plate assembly (1-1) and the bottom plate (3), and a guide rail and a guide groove that are configured for preventing misalignment during folding.

[0017] Further, an anti-detachment track (1-2) is provided between the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) to prevent the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) from slipping off.

[0018] Further, a side edge of the bottom plate (3) is hinged to a lower part of one of the four bidirectional retractable plate assemblies (1-1); the four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), where each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1); the two folding assem-

blies (3-1-1) are hinged to each other; and the two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other.

[0019] Further, the bottom plate (3) is a two-piece bottom plate; two opposite side edges of the bottom plate (3) are hinged to lower parts of two opposite bidirectional retractable plate assemblies (1-1); the four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), where each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1); the two folding assemblies (3-1-1) are hinged to each other; and the two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other.

[0020] Further, among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form a flipping assembly (3-2-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form an infolding assembly (3-2-2); the flipping assembly (3-2-1) further includes flipping beams (3-211) provided above the bidirectional retractable plate assemblies (1-1); upper parts of the bidirectional retractable plate assemblies (1-1) are rotatably connected to the flipping beams (3-211); two ends of the flipping beam (3-211) are respectively fixedly connected to the bidirectional retractable plate assemblies (1-1) of the corresponding infolding assembly (3-2-2) at two sides; each of the bidirectional retractable plate assemblies (1-1) of the infolding assembly (3-22) includes an upper infolding sub-assembly (3-221) and a lower infolding sub-assembly (3-222) that are hinged to each other; and a lower part of the lower infolding sub-assembly (3-222) is hinged to a bottom retractable assembly.

[0021] Further, among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form a first folding assembly (3-3-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form a second folding assembly (3-3-2); lower parts of the bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) are hinged to the bottom plate (3); the second folding assembly (3-3-2) further includes two vertically folding avoidance plates (3-321) respectively provided below the two bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) after the first folding assembly is folded; and each of the vertically folding avoidance plates (3-321) includes a lower part fixedly connected to the bottom plate (3) and an upper part correspondingly hinged to the lower part of the bidirectional retractable plate assembly (1-1).

[0022] Further, in order to ensure that the overturning between the side walls of the storage box and between each side wall and the bottom plate is more stable, and ensure that the edge positions of the inner and outer plates of each side wall and the bottom plate can be aligned at any time without interference in an unfolded

state or in a folded state, realizing that each side wall and the bottom plate can be smoothly pushed and pulled to achieve retraction and extension whether in the unfolded state or in the folded state, hinge assemblies (4) are provided between lower parts of the two bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) and the bottom plate (3) or between two adjacent bidirectional retractable plate assemblies (1-1), and hinge assemblies (4) are provided between lower parts of the two bidirectional retractable plate assemblies (1-1) of the second folding assembly (3-3-2) and upper parts of the vertically folding avoidance plates (3-321); and

the hinge assembly (4) includes a first outer rotating plate (4-1), a second outer rotating plate (4-2), an arc-shaped elastic connector (4-3), a first inner rotating plate (4-4), a second inner rotating plate (4-5), and a hinge (4-6); the first outer rotating plate (4-1) and the second outer rotating plate (4-2) are fixedly connected through the arc-shaped elastic connector (4-3); alternatively, the first outer rotating plate, the second outer rotating plate, and the arc-shaped elastic connector are manufactured into an integrated connection structure; the first inner rotating plate (4-4) and the second inner rotating plate (4-5) are hinged to each other through the hinge (4-6); the first inner rotating plate (4-4) is correspondingly provided at an inner side of the first outer rotating plate (4-1); between the first inner rotating plate (4-4) and the first outer rotating plate (4-1), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a first slide rail (4-61), and the other side is provided with a first slider (4-62) that is in a sliding fit with the first slide rail (4-61); a sliding direction of the first inner rotating plate (4-4) relative to the first outer rotating plate (4-1) is perpendicular to a rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5); the second inner rotating plate (4-5) is correspondingly provided at an inner side of the second outer rotating plate (4-2); between the second inner rotating plate (4-5) and the second outer rotating plate (4-2), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a second slide rail (4-71), and the other side is provided with a second slider (4-72) that is in the sliding fit with the second slide rail (4-71); and a sliding direction of the second inner rotating plate (4-5) relative to the second outer rotating plate (4-2) is perpendicular to the rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5).

[0023] Further, a vertically folding avoidance plate (3-321) is provided at a position of the bottom plate (3) connected to the lower part of the bidirectional retractable plate assembly (1-1) or on any bidirectional retractable plate assembly (1-1) of two adjacent bidirectional retractable plate assemblies (1-1); and the hinge assembly (4) is provided between the bidirectional retractable plate assembly (1-1) and the vertically folding avoidance plate (3-321).

[0024] Moreover, another objective of the present dis-

closure is to provide a bidirectional retractable plate assembly for the above storage box with the size that can be freely adjusted in three directions. After the bidirectional retractable plate assembly is used as the side plate or the bottom plate and spliced into a box body, the storage box with the size that can be freely adjusted in three directions can be obtained.

[0025] In order to achieve the above objective, the present disclosure adopts the following technical solution:

A bidirectional retractable plate assembly for a resizable storage box, where the bidirectional retractable plate assembly (1-1) includes a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection; and respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0026] Further, the bidirectional retractable plate assembly (1-1) further includes a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0027] Further, the bidirectional retractable plate assembly (1-1) further includes a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection, and a third lateral retractable plate (1-23) and a fourth lateral retractable plate (1-24) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at an upper side; the third lateral retractable plate (1-23) and the fourth lateral retractable plate (1-24) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a lower side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) and a sliding direction of the third lateral retractable plate (1-23) relative to the fourth lateral retractable plate (1-24) are identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0028] Further, the bidirectional retractable plate assembly (1-1) further includes combined retractable edge plates (2-1) respectively located at two straight sides of the four-directional retractable assembly (1-1); each of

the combined retractable edge plates (2-1) includes a first fixed edge plate (2-11) connected to the first lateral corrugated plate (1-11), a second fixed edge plate (2-12) connected to the second lateral corrugated plate (1-12), and a corrugated edge plate (2-13) provided between the first fixed edge plate (2-11) and the second fixed edge plate (2-12); and retraction and extension directions of the corrugated edge plate (2-13) are perpendicular to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0029] Further, a hinge assembly (4) is provided between a side or a middle position of the bidirectional retractable plate assembly (1-1); the hinge assembly (4) includes a first outer rotating plate (4-1), a second outer rotating plate (4-2), an arc-shaped elastic connector (4-3), a first inner rotating plate (4-4), a second inner rotating plate (4-5), and a hinge (4-6); the first outer rotating plate (4-1) and the second outer rotating plate (4-2) are fixedly connected through the arc-shaped elastic connector (4-3); alternatively, the first outer rotating plate, the second outer rotating plate, and the arc-shaped elastic connector are manufactured into an integrated connection structure; the first inner rotating plate (4-4) and the second inner rotating plate (4-5) are hinged to each other through the hinge (4-6); the first inner rotating plate (4-4) is correspondingly provided at an inner side of the first outer rotating plate (4-1); between the first inner rotating plate (4-4) and the first outer rotating plate (4-1), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a first slide rail (4-61), and the other side is provided with a first slider (4-62) that is in a sliding fit with the first slide rail (4-61); a sliding direction of the first inner rotating plate (4-4) relative to the first outer rotating plate (4-1) is perpendicular to a rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5); the second inner rotating plate (4-5) is correspondingly provided at an inner side of the second outer rotating plate (4-2); between the second inner rotating plate (4-5) and the second outer rotating plate (4-2), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a second slide rail (4-71), and the other side is provided with a second slider (4-72) that is in the sliding fit with the second slide rail (4-71); and a sliding direction of the second inner rotating plate (4-5) relative to the second outer rotating plate is perpendicular to the rotation direction of the first inner rotating plate relative to the second inner rotating plate (4-5).

[0030] Compared with the prior art, the present disclosure has the following advantages:

(1) The present disclosure reasonable use of the retraction and extension characteristic of the corrugated plate to achieve retraction and extension in one direction. The first core invention point of the present disclosure is as follows: the present disclosure utilizes the bidirectional retractable plate assembly formed by at least two corrugated plates that are in a slidable sleeve connection. The sliding direc-

tions of the corrugated plates in the slidable sleeve connection are perpendicular to the respective retraction and extension directions thereof, achieving free retraction and extension of a single plane in two directions without interference. In addition, the retraction and extension of in the two directions can be independently controlled, and through this basic structure, the area of a specific plane (i.e. the side wall or bottom plate) of the box body can be arbitrarily changed. The second core invention point of the present disclosure is as follows: the present disclosure can adopt a plurality of four-directional retractable assemblies to form a box body. The box body can be independently and freely retracted and extended in three directions, changing the volume of the box body within a certain range to adapt to items of different sizes. In this way, the items can be tightly packaged, protecting the items and saving space for easy handling.

(2) In addition, the storage box of the present disclosure is further provided with various folding structures. The box body can be folded for storage in idle times to reduce the volume of the box body and save space.

(3) Moreover, in the present disclosure, the four-directional retractable assemblies of the storage box can be connected through a hinged, magnetic suction, or buckle means for easy disassembly and mounting. The storage box of the present disclosure is very suitable for mass-production and use in industrial production processes, and can be widely applied in fields that require storage boxes for circulation, with high commercial value.

DESCRIPTION OF THE DRAWINGS

[0031] The present disclosure is further described below with reference to the drawings in conjunction with the embodiments.

FIG. 1 is a structural diagram of a resizable storage box in a non-retracted state according to Embodiment 1 of the present disclosure;

FIG. 2 is a structural diagram of a bottom of the resizable storage box in a non-retracted state according to Embodiment 1 of the present disclosure;

FIG. 3 is a structural diagram of the bottom of the resizable storage box in a retracted state according to Embodiment 1 of the present disclosure;

FIG. 4 is a partial sectional view of a bidirectional retractable plate assembly according to Embodiment 1 of the present disclosure;

FIG. 5 is a structural diagram of a resizable storage box in a non-retracted state according to Embodiment 2 of the present disclosure;

FIG. 6 is a structural diagram of a bottom of the resizable storage box in a retracted state according to Embodiment 2 of the present disclosure;

FIG. 7 is a structural diagram of a resizable storage box in a non-retracted state according to Embodiment 3 of the present disclosure;

FIG. 8 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 4 of the present disclosure;

FIG. 9 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 5 of the present disclosure;

FIG. 10 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 6 of the present disclosure;

FIG. 11 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 7 of the present disclosure;

FIG. 12 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 8 of the present disclosure;

FIG. 13 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 9 of the present disclosure;

FIG. 14 is a structural diagram of a bottom of a resizable storage box in a non-retracted state according to Embodiment 10 of the present disclosure;

FIG. 15 is a first structural diagram of a first folding method according to Embodiment 3 of the present disclosure;

FIG. 16 is a second structural diagram of the first folding method according to Embodiment 3 of the present disclosure;

FIG. 17 is a third structural diagram of the first folding method according to Embodiment 3 of the present disclosure;

FIG. 18 is a first structural diagram of a second folding method according to Embodiment 3 of the present disclosure;

FIG. 19 is a first structural diagram of a third folding method according to Embodiment 3 of the present disclosure;

FIG. 20 is a second structural diagram of the third folding method according to Embodiment 3 of the present disclosure;

FIG. 21 is a third structural diagram of the third folding method according to Embodiment 3 of the present disclosure;

FIG. 22 is a fourth structural diagram of the third folding method according to Embodiment 3 of the present disclosure;

FIG. 23 is a first structural diagram of a fourth folding method according to Embodiment 3 of the present disclosure;

FIG. 24 is a second structural diagram of the fourth folding method according to Embodiment 3 of the present disclosure;

FIG. 25 is a third structural diagram of the fourth folding method according to Embodiment 3 of the present disclosure;

FIG. 26 is a fourth structural diagram of the fourth

folding method according to Embodiment 3 of the present disclosure;

FIG. 27 is a front view of a hinge assembly according to Embodiment 3 of the present disclosure;

FIG. 28 is a bottom view of the hinge assembly according to Embodiment 3 of the present disclosure;

FIG. 29 is a first structural diagram of the hinge assembly according to Embodiment 3 of the present disclosure;

FIG. 30 is a second structural diagram of the hinge assembly according to Embodiment 3 of the present disclosure;

FIG. 31 is a third structural diagram of the hinge assembly according to Embodiment 3 of the present disclosure;

FIG. 32 is a first structural diagram of a second hinge assembly according to the present disclosure; and

FIG. 33 is a second structural diagram of the second hinge assembly according to the present disclosure.

[0032] Reference numbers in the figures are illustrated as follows:

1, side wall; 1-1, bidirectional retractable plate assembly (1-1); 1-11, first lateral corrugated plate; 1-12, second lateral corrugated plate; 1-21, first lateral retractable plate; 1-22, second lateral retractable plate; 1-23, third lateral retractable plate; 1-24, fourth lateral retractable plate; 2-1, combined retractable edge plate; 2-11, first fixed edge plate; 2-12, second fixed edge plate; 2-13, corrugated edge plate; 3, bottom plate; 3-1, bottom four-directional retractable assembly; 3-11, first bottom corrugated plate; 3-12, second bottom corrugated plate; 3-21, first bottom retractable plate; 3-22, second bottom retractable plate; 3-23, third bottom retractable plate; 3-24, fourth bottom retractable plate; 3-31, combined retractable edge plate; 3-311, first bottom fixed edge plate; 3-312, second bottom fixed edge plate; 3-313, bottom corrugated edge plate; 3-41, bottom retractable plate assembly; 3-411, first bottom flat plate; 3-412, second bottom flat plate; 3-1-1, folding assembly; 3-2-1, flipping assembly; 3-2-2, infolding assembly; 3-211, flipping beam; 3-221, upper infolding sub-assembly; 3-222, lower infolding sub-assembly; 3-3-1, first folding assembly; 3-3-2, second folding assembly; 3-321, vertically folding avoidance plate; 3-51, bottom base plate; 3-61, side frame; 3-62, sliding rod; 3-611, first side frame member; 3-612, second side frame member; 3-621, first rod member; 3-622, second rod member; 4, hinge assembly; 4-1, first outer rotating plate; 4-2, second outer rotating plate; 4-3, arc-shaped elastic connector; 4-4, first inner rotating plate; 4-5, second inner rotating plate; 4-6, hinge; 4-61, first slide rail; 4-62, first slider; 4-71, second slide rail; and 4-72, second slider.

SPECIFIC IMPLEMENTATIONS

[0033] The present disclosure is described in detail

below with reference to the drawings and specific embodiments.

Embodiment 1

[0034] Referring to FIGS. 1 to 4, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0035] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes first bottom corrugated plate (3-11) and second bottom corrugated plate (3-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0036] As shown in FIG. 4, in order to prevent the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) from being detached during a sliding process, anti-detachment track (1-2) is provided between the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) to prevent the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) from slipping off. The anti-detachment track (1-2) is a T-shaped track. Of course, in other embodiments, the anti-detachment track can also be a dovetail-shaped track or other track with an anti-detachment function. An extension direction of the anti-detachment track (1-2) is perpendicular to the retraction and extension directions of a single corrugated plate.

Embodiment 2

[0037] Referring to FIGS. 5 and 6, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the

first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0038] Each of the four bidirectional retractable plate assemblies (1-1) further includes first lateral retractable plate (1-21) and second lateral retractable plate (1-22) that are in a slidable sleeve connection. The first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side. A sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0039] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes first bottom corrugated plate (3-11) and second bottom corrugated plate (3-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

[0040] The bottom plate (3) further includes first bottom retractable plate (3-21) and second bottom retractable plate (3-22) that are in a slidable sleeve connection, and third bottom retractable plate (3-23) and fourth bottom retractable plate (3-24) that are in a slidable sleeve connection. The first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at an upper side. The third bottom retractable plate (3-23) and the fourth bottom retractable plate (3-24) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a lower side. A sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) and a sliding direction of the third bottom retractable plate (3-23) relative to the fourth bottom retractable plate (3-24) are identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

Embodiment 3

[0041] Referring to FIG. 7, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are

perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0042] Each of the four bidirectional retractable plate assemblies (1-1) further includes first lateral retractable plate (1-21) and second lateral retractable plate (1-22) that are in a slidable sleeve connection, and third lateral retractable plate (1-23) and fourth lateral retractable plate (1-24) that are in a slidable sleeve connection. The first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at an upper side. The third lateral retractable plate (1-23) and the fourth lateral retractable plate (1-24) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a lower side. A sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) and a sliding direction of the third lateral retractable plate (1-23) relative to the fourth lateral retractable plate (1-24) are identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

Embodiment 4

[0043] Referring to FIG. 8, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0044] Each of the four bidirectional retractable plate assemblies (1-1) further includes combined retractable edge plates (2-1) respectively located at two straight sides of the four-directional retractable assembly (1-1). Each of the combined retractable edge plates (2-1) includes first fixed edge plate (2-11) connected to the first lateral corrugated plate (1-11), second fixed edge plate (2-12) connected to the second lateral corrugated plate (1-12), and corrugated edge plate (2-13) provided between the first fixed edge plate (2-11) and the second fixed edge plate (2-12).

[0045] Two straight sides of the first lateral corrugated plate (1-11) are respectively connected to corresponding first fixed edge plates (2-11). Two straight sides of the second lateral corrugated plate (1-12) are respectively connected to corresponding second fixed edge plates (2-12). The first side corrugated plate (1-11) and the

second side corrugated plate (1-12) are not in contact with the corrugated edge plates (2-13) at two sides.

[0046] Retraction and extension directions of the corrugated edge plate (2-13) are perpendicular to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0047] The structure of the bottom plate (3) is the same as that of the bottom plate in Embodiment 1. The bottom plate includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes first bottom corrugated plate (3-11) and second bottom corrugated plate (3-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

Embodiment 5

[0048] Referring to FIG. 9, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0049] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes first bottom corrugated plate (3-11) and second bottom corrugated plate (3-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12). The bottom plate (3) further includes combined retractable edge plates (3-31) respectively located at two straight sides of the four-directional retractable assembly (3-1). Each of the combined retractable edge plates (3-31) includes first bottom fixed edge plate (3-311) connected to the first bottom corrugated plate (3-11), second bottom fixed edge plate (3-312) connected to the second bottom corrugated plate (3-12), and bottom corrugated edge plate (3-313) provided between the first bottom fixed edge plate (3-311) and the second bottom fixed edge plate (3-312). Two straight sides of the first bottom corrugated plate (3-11) are respectively connected to corresponding first bottom fixed edge plates (3-311). Two

straight sides of the second bottom corrugated plate (3-12) are respectively connected to corresponding first bottom fixed edge plates (3-312). The first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are not in contact with the bottom corrugated edge plates (3-313) at two sides. The retraction and extension directions of the bottom corrugated edge plate (3-313) are perpendicular to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

Embodiment 6

[0050] Referring to FIG. 10, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0051] The bottom plate (3) includes bottom four-directional retractable assembly (3-1) composed of two bottom retractable plate assemblies (3-41) that are in a slidable sleeve connection. The bottom four-directional retractable assembly (3-1) includes first bottom flat plate (3-411) and second bottom flat plate (3-412) that are in a slidable sleeve connection.

Embodiment 7

[0052] Referring to FIG. 11, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12). Each of the four bidirectional retractable plate assemblies (1-1) further includes first lateral retractable plate (1-21) and second lateral retractable plate (1-22) that are in a slidable sleeve connection. The first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side.

A sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0053] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes first bottom corrugated plate (3-11) and second bottom corrugated plate (3-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12). The bottom plate (3) further includes first bottom retractable plate (3-21) and second bottom retractable plate (3-22) that are in a slidable sleeve connection. The first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a same side. A sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) is identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

Embodiment 8

[0054] Referring to FIG. 12, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0055] The bottom plate (3) is made of an ordinary rectangular bottom plate. Before use, the side wall 1 is first adjusted to a required size according to a size of an item to be stored. Then, the bottom plate (3) is adjusted to a required size, and is fixed to the side wall (1) for packaging.

[0056] In addition, in each of the above embodiments, the resizable storage box includes a box body with an accommodating space formed by the side wall (1) and the bottom plate (3) that are connected, and the side wall includes four bidirectional retractable plate assemblies (1-1). On this basis, in order to facilitate packaging and transportation, the box body can further be provided with an upper cover with a same structure as the bottom plate (3) in the above embodiments. Thus, after the upper

cover is closed, the resizable storage box has a closed box space, further expanding the usage scenarios and purposes of the present disclosure.

Embodiment 9

[0057] Referring to FIG. 13, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12). Each of the four bidirectional retractable plate assemblies (1-1) further includes first lateral retractable plate (1-21) and second lateral retractable plate (1-22) that are in a slidable sleeve connection. The first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side. A sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0058] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes four bottom base plates (3-51) that have a folded state or an unfolded state. Each of the bottom base plates (3-51) is connected to a bottom of a lateral retractable assembly located at a corresponding position. In the folded state, the four bottom base plates (3-51) are slidable relative to the retraction and extension of the side retractable assemblies, thereby correspondingly changing an area and size of the bottom plate (3) in the folded state.

Embodiment 10

[0059] Referring to FIG. 14, this embodiment provides a resizable storage box. The storage box includes a box body with an accommodating space formed by side wall (1) and bottom plate (3) that are connected. The side wall includes four bidirectional retractable plate assemblies (1-1). Each of the bidirectional retractable plate assemblies (1-1) includes first lateral corrugated plate (1-11) and second lateral corrugated plate (1-12) that are in a slidable sleeve connection. Respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral

corrugated plate (1-11) relative to the second lateral corrugated plate (1-12). Each of the four bidirectional retractable plate assemblies (1-1) further includes first lateral retractable plate (1-21) and second lateral retractable plate (1-22) that are in a slidable sleeve connection. The first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side. A sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

[0060] The bottom plate (3) includes bottom four-directional retractable assembly (3-1). The bottom four-directional retractable assembly (3-1) includes a hollow structure surrounded by four side frames (3-61) connected end to end. A plurality of sliding rods (3-62) are provided at a hollow position to form an enclosure and are slidable relative to the side frames (3-61). When the sliding rods (3-62) are slid, a spacing between two adjacent sliding rods (3-62) is adjustable to adapt to items of different sizes. Each of the side frames (3-61) at least includes first side frame member (3-611) and second side frame member (3-612) that are in a slidable connection. The first side frame member (3-611) and the second side frame member (3-612) are slidable relative to each other in a length direction to make the side frame (3-61) resizable. Each of the sliding rods (3-62) at least includes first rod member (3-621) and second rod member (3-622) that are in a slidable connection. The first rod member (3-621) and the second rod member (3-622) are slidable relative to each other in a length direction to adapt to a change in the side frame (3-61).

Embodiment 11

[0061] FIGS. 15 to 17 show an embodiment of a first folding method of the resizable storage box described in Embodiment 3. A side edge of the bottom plate (3) is hinged to a lower part of one of the four bidirectional retractable plate assemblies (1-1). The four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), where each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1). The two folding assemblies (3-1-1) are hinged to each other. The two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other. Through the above structure, single sided folding is achieved.

Embodiment 12

[0062] FIG. 18 shows an embodiment of a second folding method of the resizable storage box described in Embodiment 3. The bottom plate (3) is a two-piece

bottom plate. Two opposite side edges of the bottom plate (3) are hinged to lower parts of two opposite bidirectional retractable plate assemblies (1-1). The four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), where each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1). The two folding assemblies (3-1-1) are hinged to each other. The two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other. The bottom plate (3) is a two-piece bottom plate. Two opposite side edges of the bottom plate (3) are hinged to lower parts of two opposite bidirectional retractable plate assemblies (1-1). The four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), where each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1). The two folding assemblies (3-1-1) are hinged to each other. The two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other. Through the above structure, two-sided folding is achieved.

Embodiment 13

[0063] FIGS. 19 to 22 show an embodiment of a third folding method of the resizable storage box described in Embodiment 3. Among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form flipping assembly (3-2-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form infolding assembly (3-2-2). The flipping assembly (3-2-1) further includes flipping beams (3-211) provided above the bidirectional retractable plate assemblies (1-1). Upper parts of the bidirectional retractable plate assemblies (1-1) are rotatably connected to the flipping beams (3-211). Two ends of the flipping beam (3-211) are respectively fixedly connected to the bidirectional retractable plate assemblies (1-1) of the corresponding infolding assembly (3-2-2) at two sides. Each of the bidirectional retractable plate assemblies (1-1) of the infolding assembly (3-22) includes upper infolding sub-assembly (3-221) and lower infolding sub-assembly (3-222) that are hinged to each other. A lower part of the lower infolding sub-assembly (3-222) is hinged to a bottom retractable assembly. Through the above structure, symmetrical folding is achieved.

Embodiment 14

[0064] FIGS. 23 to 26 show an embodiment of a fourth folding method of the resizable storage box described in Embodiment 3. Among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form first folding assembly (3-3-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form second folding assembly

bly (3-3-2). Lower parts of the bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) are hinged to the bottom plate (3). The second folding assembly (3-3-2) further includes two vertically folding avoidance plates (3-321) respectively provided below the two bidirectional retractable plate assemblies (1-1) to avoid a thickness of the bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) after the first folding assembly is folded. Each of the vertically folding avoidance plates (3-321) includes a lower part fixedly connected to the bottom plate (3) and an upper part correspondingly hinged to the lower part of the bidirectional retractable plate assembly (1-1). Through the above structure, four-sided folding is achieved.

Embodiment 15

[0065] As shown in FIGS. 27 to 31, this embodiment relates to a special hinge assembly for the resizable storage box described in Embodiment 3. The difference between this embodiment and Embodiment 3 is as follows. In order to ensure the flipping stability between various side walls of the storage box and between each side wall and the bottom plate, hinge assembly (4) is provided between the lower part of each of the two bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) and the bottom plate (3). Hinge assembly (4) is further provided between the lower part of each of the two bidirectional retractable plate assemblies (1-1) of the second folding assembly (3-3-2) and the upper part of the vertically folding avoidance plate (3-321).

[0066] The hinge assembly (4) includes first outer rotating plate (4-1), second outer rotating plate (4-2), arc-shaped elastic connector (4-3), first inner rotating plate (4-4), second inner rotating plate (4-5), and hinge (4-6).

[0067] The first outer rotating plate (4-1) and the second outer rotating plate (4-2) are fixedly connected through the arc-shaped elastic connector (4-3). Alternatively, the first outer rotating plate, the second outer rotating plate, and the arc-shaped elastic connector are manufactured into an integrated connection structure. The first inner rotating plate (4-4) and the second inner rotating plate (4-5) are hinged to each other through the hinge (4-6).

[0068] The first inner rotating plate (4-4) is correspondingly provided at an inner side of the first outer rotating plate (4-1). Between the first inner rotating plate (4-4) and the first outer rotating plate (4-1), one side adjacent to the arc-shaped elastic connector (4-3) is provided with first slide rail (4-61), and the other side is provided with first slider (4-62) that is in a sliding fit with the first slide rail (4-61). A sliding direction of the first inner rotating plate (4-4) relative to the first outer rotating plate (4-1) is perpendicular to a rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5).

[0069] The second inner rotating plate (4-5) is corre-

spondingly provided at an inner side of the second outer rotating plate (4-2). Between the second inner rotating plate (4-5) and the second outer rotating plate (4-2), one side adjacent to the arc-shaped elastic connector (4-3) is provided with second slide rail (4-71), and the other side is provided with second slider (4-72) that is in a sliding fit with the second slide rail (4-71). A sliding direction of the second inner rotating plate (4-5) relative to the second outer rotating plate (4-2) is perpendicular to the rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5).

[0070] In this embodiment, the first outer rotating plate (4-1) can be fixedly provided on the first lateral corrugated plate (1-11) of the bidirectional retractable plate assembly (1-1). Alternatively, the first outer rotating plate (4-1) and the first lateral corrugated plate (1-11) can also be formed into an integrated structure. Alternatively, the first lateral corrugated plate (1-11) directly serves as the first outer rotating plate (4-1). Similarly, the second outer rotating plate (4-2) can be fixedly provided on the bottom plate (3) or the vertically folding avoidance plate (3-321). Alternatively, the second outer rotating plate (4-2) and the bottom plate (3) or the vertically folding avoidance plate (3-321) can also be formed into an integrated structure. Alternatively, the bottom plate (3) or the vertically folding avoidance plate (3-321) directly serves as the second outer rotating plate (4-2).

[0071] Meanwhile, the first slide rail (4-61) and the second slide rail (4-71) can be independently provided between the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) of the bidirectional retractable plate assembly (1-1). Alternatively, they can directly serve as a sliding structure between the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12).

Embodiment 16

[0072] As shown in FIGS. 32 and 33, this embodiment is another embodiment of the hinge assembly described in the present disclosure. The hinge assembly in this embodiment and the hinge assembly in the previous embodiment differ as follows. The mounting position of the hinge (4-6) between the first inner rotating plate (4-4) and the second inner rotating plate (4-5) is different. In this embodiment, the hinge is provided on the other side of the first inner rotating plate (4-4) and the second inner rotating plate (4-5). The remaining structure is the same as the previous embodiment.

[0073] Meanwhile, the various structures of the bidirectional retractable plate assemblies (1-1) described in the above embodiments of the present disclosure can also be taken as various side plates or bottom plates at will. This is also a technical solution protected by the present disclosure, and will not be repeated herein.

[0074] In the present disclosure, the advantages of the hinge assembly (4) are as follows. The first slide rail (4-61) and the first slider (4-62), as well as the second

slide rail (4-71), and the second slider (4-72), form a sliding structure. In both folded and unfolded states, the first outer rotating plate (4-1) and the second outer rotating plate (4-2), as well as the first inner rotating plate (4-4) and the second inner rotating plate (4-5), can be freely slidably retracted and extended. The first slide rail (4-61) and the second slide rail (4-71) play a limiting role. The displacement that may occur during the folding process between the inner and outer plates is adjusted through the arc-shaped elastic connector (4-3) to ensure that their folding direction is always perpendicular to the sliding direction. The design greatly improves the stability of the folding structure between the side wall and the bottom plate, as well as between various side walls. In addition, the edge positions of the inner and outer plates between the side wall and the bottom plate, as well as between various side walls, can be aligned at any time without interference in the folded or unfolded state. Thus, each side wall and the bottom plate can be smoothly pushed and pulled to achieve retraction and extension in the folded or unfolded state. Meanwhile, in order to smoothly achieve the purpose of retraction and extension, when the edge positions of the inner and outer plates between each side wall and the bottom plate, as well as between various side walls, are hinged, the best connection method is to provide a hinge structure between the mutually close inner plates, as well as between the mutually close outer plates.

[0075] In the description of the present disclosure, the term "hinge" is only intended to describe the connection relationship between the components. Therefore, features defined by "hinge" can explicitly or implicitly include various implementations such as fold hinge, butt hinge, and link hinge.

[0076] In addition, it should be noted that the corresponding drawings of the corrugated plates described in the embodiment show a structure with a wave-shaped cross-section. It is easy for those skilled in the art to conceive that a solution of modifying the wave shape into to a square shape, a V shape, a trapezoidal shape, or a combination thereof should be included within the protection scope of the present disclosure. In addition, those skilled in the art should understand that the slidable sleeve structure of the corrugated plates requires appropriate damping such that two corrugated plates can slide relative to each other and maintain a certain friction force at a specific position to achieve locking effect, thereby maintaining a certain spatial shape and size of the box body.

[0077] Although the present disclosure is described above in detail according to the specific embodiments and alternatives thereof, it should be understood that various changes and modifications made without departing from the spirit and scope of the present disclosure can also be implemented. In the embodiments of the present application, unless otherwise clearly specified, the terms such as "connection" and "fixation" are intended to be understood in a broad sense. For example, the "connec-

tion" may be a fixed connection, removable connection or integral connection; may be a mechanical connection or electrical connection; may be a direct connection or indirect connection via a medium; and may be a communication or interaction between two elements. Those of ordinary skill in the art may understand specific meanings of the above terms in the present disclosure based on a specific situation. In addition, orientation or position relationships indicated by terms such as "upper and lower" and "left and right" are shown in the drawings. These terms are merely intended to facilitate and simplify the description, rather than to indicate or imply a specific orientation.

[0078] Therefore, it should be understood that the present disclosure is not subject to any limitations except for the claims and equivalents thereof.

Claims

1. A resizable storage box, comprising a box body with an accommodating space formed by a side wall (1) and at least one bottom plate (3) that are connected, wherein the side wall comprises four bidirectional retractable plate assemblies (1-1); **characterized in that** each of the bidirectional retractable plate assemblies (1-1) comprises a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection; and respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
2. The resizable storage box according to claim 1, **characterized in that** each of the bidirectional retractable plate assemblies (1-1) further comprises a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
3. The resizable storage box according to claim 1, **characterized in that** each of the bidirectional retractable plate assemblies (1-1) further comprises a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection, and a third lateral retractable

- plate (1-23) and a fourth lateral retractable plate (1-24) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at an upper side; the third lateral retractable plate (1-23) and the fourth lateral retractable plate (1-24) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a lower side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) and a sliding direction of the third lateral retractable plate (1-23) relative to the fourth lateral retractable plate (1-24) are identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
4. The resizable storage box according to claim 1, **characterized in that** each of the bidirectional retractable plate assemblies (1-1) further comprises combined retractable edge plates (2-1) respectively located at two straight sides of the bidirectional retractable plate assembly (1-1); each of the combined retractable edge plates (2-1) comprises a first fixed edge plate (2-11) connected to the first lateral corrugated plate (1-11), a second fixed edge plate (2-12) connected to the second lateral corrugated plate (1-12), and a corrugated edge plate (2-13) provided between the first fixed edge plate (2-11) and the second fixed edge plate (2-12); and retraction and extension directions of the corrugated edge plate (2-13) are perpendicular to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
5. The resizable storage box according to claim 1, **characterized in that** the bottom plate (3) comprises a bottom bidirectional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) comprises a first bottom corrugated plate (3-11) and a second bottom corrugated plate (3-12) that are in the slidable sleeve connection; and respective retraction and extension directions of the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) are perpendicular to a sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).
6. The resizable storage box according to claim 5, **characterized in that** the bottom plate (3) further comprises a first bottom retractable plate (3-21) and a second bottom retractable plate (3-22) that are in the slidable sleeve connection; the first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a same side; and a sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) is identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).
7. The resizable storage box according to claim 5, **characterized in that** the bottom plate (3) further comprises a first bottom retractable plate (3-21) and a second bottom retractable plate (3-22) that are in the slidable sleeve connection, and a third bottom retractable plate (3-23) and a fourth bottom retractable plate (3-24) that are in the slidable sleeve connection; the first bottom retractable plate (3-21) and the second bottom retractable plate (3-22) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at an upper side; the third bottom retractable plate (3-23) and the fourth bottom retractable plate (3-24) are respectively connected to the first bottom corrugated plate (3-11) and the second bottom corrugated plate (3-12) at a lower side; and a sliding direction of the first bottom retractable plate (3-21) relative to the second bottom retractable plate (3-22) and a sliding direction of the third bottom retractable plate (3-23) relative to the fourth bottom retractable plate (3-24) are identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).
8. The resizable storage box according to claim 5, **characterized in that** the bottom plate (3) further comprises combined retractable edge plates (3-31) respectively located at two straight sides of the four-directional retractable assembly (3-1); each of the combined retractable edge plates (3-31) comprises a first bottom fixed edge plate (3-311) connected to the first bottom corrugated plate (3-11), a second bottom fixed edge plate (3-312) connected to the second bottom corrugated plate (3-12), and a bottom corrugated edge plate (3-313) provided between the first bottom fixed edge plate (3-311) and the second bottom fixed edge plate (3-312); and retraction and extension directions of the bottom corrugated edge plate (3-313) are perpendicular to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).
9. The resizable storage box according to claim 1, **characterized in that** the bottom plate (3) comprises two bottom retractable plate assemblies (3-41) that are in the slidable sleeve connection; each of the bottom retractable plate assemblies (3-41) comprises a first bottom flat plate (3-411) and a second bottom flat plate (3-412) that are in the slidable sleeve connection; and slidable retraction and extension directions of the first bottom flat plate (3-411) and the second bottom flat plate (3-412) are identical to the sliding direction of the first bottom corrugated plate (3-11) relative to the second bottom corrugated plate (3-12).

tion and extension directions of the two bottom retractable plate assemblies (3-41) are perpendicular to a sliding direction of the first bottom flat plate (3-411) relative to the second bottom flat plate (3-412).

10. The resizable storage box according to claim 1, **characterized in that** the bottom plate (3) comprises a bottom four-directional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) comprises four bottom base plates (3-51) that have a folded state or an unfolded state; and each of the bottom base plates (3-51) is connected to a bottom of a lateral retractable assembly located at a corresponding position.

11. The resizable storage box according to claim 1, **characterized in that** the bottom plate (3) comprises a bottom four-directional retractable assembly (3-1); the bottom four-directional retractable assembly (3-1) comprises a hollow structure surrounded by four side frames (3-61) connected end to end; at least one sliding rod (3-62) is provided at a hollow position to form an enclosure and is slidable relative to the side frames (3-61); when the sliding rods (3-62) are slid, a spacing between two adjacent sliding rods (3-62) is adjustable; each of the side frames (3-61) at least comprises a first side frame member (3-611) and a second side frame member (3-612) that are in a slidable connection; the first side frame member (3-611) and the second side frame member (3-612) are slidable relative to each other in a length direction to make the side frame (3-61) resizable; each of the sliding rods (3-62) at least comprises a first rod member (3-621) and a second rod member (3-622) that are in a slidable connection; and the first rod member (3-621) and the second rod member (3-622) are slidable relative to each other in a length direction to adapt to a change in the side frame (3-61).

12. The resizable storage box according to claim 1, **characterized in that** a hinged, magnetic suction, or buckle structure is provided to form a connection between the bidirectional retractable plate assemblies (1-1), as well as between the bidirectional retractable plate assembly (1-1) and the bottom plate (3).

13. The foldable storage box according to any one of claim 1, **characterized in that** an anti-detachment track (1-2) is provided between the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) to prevent the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) from slipping off.

14. The resizable storage box according to claim 1,

characterized in that a side edge of the bottom plate (3) is hinged to a lower part of one of the four bidirectional retractable plate assemblies (1-1); alternatively, the bottom plate (3) is a two-piece bottom plate; and two opposite side edges of the bottom plate (3) are hinged to lower parts of two opposite bidirectional retractable plate assemblies (1-1); and the four bidirectional retractable plate assemblies (1-1) form two folding assemblies (3-1-1), wherein each of the two folding assemblies (3-1-1) is formed by two adjacent bidirectional retractable plate assemblies (1-1); the two folding assemblies (3-1-1) are hinged to each other; and the two bidirectional retractable plate assemblies (1-1) of each of the folding assemblies (3-1-1) are hinged to each other.

15. The resizable storage box according to claim 1, **characterized in that** among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form a flipping assembly (3-2-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form an infolding assembly (3-2-2); the flipping assembly (3-2-1) further comprises flipping beams (3-211) provided above the bidirectional retractable plate assemblies (1-1); upper parts of the bidirectional retractable plate assemblies (1-1) are rotatably connected to the flipping beams (3-211); two ends of the flipping beam (3-211) are respectively fixedly connected to the bidirectional retractable plate assemblies (1-1) of the corresponding infolding assembly (3-2-2) at two sides; each of the bidirectional retractable plate assemblies (1-1) of the infolding assembly (3-2-2) comprises an upper infolding sub-assembly (3-221) and a lower infolding sub-assembly (3-222) that are hinged to each other; and a lower part of the lower infolding sub-assembly (3-222) is hinged to a bottom retractable assembly.

16. The resizable storage box according to claim 1, **characterized in that** among the four bidirectional retractable plate assemblies (1-1), two opposite bidirectional retractable plate assemblies (1-1) form a first folding assembly (3-3-1), and the other two opposite bidirectional retractable plate assemblies (1-1) form a second folding assembly (3-3-2); lower parts of the bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) are hinged to the bottom plate (3); the second folding assembly (3-3-2) further comprises two vertically folding avoidance plates (3-321) respectively provided below the two bidirectional retractable plate assemblies (1-1) to avoid a thickness of the bidirectional retractable plate assemblies (1-1) of the first folding assembly (3-3-1) after the first folding assembly is folded; and each of the vertically folding avoidance plates (3-321) comprises a lower part fixedly connected to the bottom plate (3) and an upper part correspond-

ingly hinged to the lower part of the bidirectional retractable plate assembly (1-1).

17. The resizable storage box according to claim 1, **characterized in that** a hinge assembly (4) is provided between a lower part of the bidirectional retractable plate assembly (1-1) and the bottom plate (3) or between two adjacent bidirectional retractable plate assemblies (1-1); the hinge assembly (4) comprises a first outer rotating plate (4-1), a second outer rotating plate (4-2), an arc-shaped elastic connector (4-3), a first inner rotating plate (4-4), a second inner rotating plate (4-5), and a hinge (4-6); the first outer rotating plate (4-1) and the second outer rotating plate (4-2) are fixedly connected through the arc-shaped elastic connector (4-3); alternatively, the first outer rotating plate, the second outer rotating plate, and the arc-shaped elastic connector are manufactured into an integrated connection structure; the first inner rotating plate (4-4) and the second inner rotating plate (4-5) are hinged to each other through the hinge (4-6); the first inner rotating plate (4-4) is correspondingly provided at an inner side of the first outer rotating plate (4-1); between the first inner rotating plate (4-4) and the first outer rotating plate (4-1), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a first slide rail (4-61), and the other side is provided with a first slider (4-62) that is in a sliding fit with the first slide rail (4-61); a sliding direction of the first inner rotating plate (4-4) relative to the first outer rotating plate (4-1) is perpendicular to a rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5); the second inner rotating plate (4-5) is correspondingly provided at an inner side of the second outer rotating plate (4-2); between the second inner rotating plate (4-5) and the second outer rotating plate (4-2), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a second slide rail (4-71), and the other side is provided with a second slider (4-72) that is in the sliding fit with the second slide rail (4-71); and a sliding direction of the second inner rotating plate (4-5) relative to the second outer rotating plate (4-2) is perpendicular to the rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5).
18. The resizable storage box according to claim 17, **characterized in that** a vertically folding avoidance plate (3-321) is provided at a position of the bottom plate (3) connected to the lower part of the bidirectional retractable plate assembly (1-1) or on any bidirectional retractable plate assembly (1-1) of two adjacent bidirectional retractable plate assemblies (1-1); and the hinge assembly (4) is provided between the bidirectional retractable plate assembly (1-1) and the vertically folding avoidance plate

(3-321).

19. The resizable storage box according to claim 18, **characterized in that** the first outer rotating plate (4-1) is partially or completely formed by the first lateral corrugated plate (1-11) of the bidirectional retractable plate assembly (1-1); alternatively, the first outer rotating plate (4-1) and the first lateral corrugated plate (1-11) are formed into an integrated structure; the second outer rotating plate (4-2) is partially or completely formed by the bottom plate (3) or the vertically folding avoidance plate (3-321); and alternatively, the second outer rotating plate (4-2) and the bottom plate (3) or the vertically folding avoidance plate (3-321) are formed into an integrated structure.
20. A bidirectional retractable plate assembly for a resizable storage box, **characterized in that** the bidirectional retractable plate assembly (1-1) comprises a first lateral corrugated plate (1-11) and a second lateral corrugated plate (1-12) that are in a slidable sleeve connection; and respective retraction and extension directions of the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) are perpendicular to a sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
21. The bidirectional retractable plate assembly for the resizable storage box according to claim 20, **characterized in that** the bidirectional retractable plate assembly (1-1) further comprises a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a same side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) is identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).
22. The bidirectional retractable plate assembly for the resizable storage box according to claim 20, **characterized in that** the bidirectional retractable plate assembly (1-1) further comprises a first lateral retractable plate (1-21) and a second lateral retractable plate (1-22) that are in the slidable sleeve connection, and a third lateral retractable plate (1-23) and a fourth lateral retractable plate (1-24) that are in the slidable sleeve connection; the first lateral retractable plate (1-21) and the second lateral retractable plate (1-22) are respectively connected to the first lateral corrugated plate (1-11) and the second

lateral corrugated plate (1-12) at an upper side; the third lateral retractable plate (1-23) and the fourth lateral retractable plate (1-24) are respectively connected to the first lateral corrugated plate (1-11) and the second lateral corrugated plate (1-12) at a lower side; and a sliding direction of the first lateral retractable plate (1-21) relative to the second lateral retractable plate (1-22) and a sliding direction of the third lateral retractable plate (1-23) relative to the fourth lateral retractable plate (1-24) are identical to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

23. The bidirectional retractable plate assembly for the resizable storage box according to claim 20, **characterized in that** the bidirectional retractable plate assembly (1-1) further comprises combined retractable edge plates (2-1) respectively located at two straight sides of the four-directional retractable assembly (1-1); each of the combined retractable edge plates (2-1) comprises a first fixed edge plate (2-11) connected to the first lateral corrugated plate (1-11), a second fixed edge plate (2-12) connected to the second lateral corrugated plate (1-12), and a corrugated edge plate (2-13) provided between the first fixed edge plate (2-11) and the second fixed edge plate (2-12); and retraction and extension directions of the corrugated edge plate (2-13) are perpendicular to the sliding direction of the first lateral corrugated plate (1-11) relative to the second lateral corrugated plate (1-12).

24. The bidirectional retractable plate assembly for the resizable storage box according to any one of claims 20-23, **characterized in that** a hinge assembly (4) is provided at a side or a middle position of the bidirectional retractable plate assembly (1-1); the hinge assembly (4) comprises a first outer rotating plate (4-1), a second outer rotating plate (4-2), an arc-shaped elastic connector (4-3), a first inner rotating plate (4-4), a second inner rotating plate (4-5), and a hinge (4-6); the first outer rotating plate (4-1) and the second outer rotating plate (4-2) are fixedly connected through the arc-shaped elastic connector (4-3); alternatively, the first outer rotating plate, the second outer rotating plate, and the arc-shaped elastic connector are manufactured into an integrated connection structure; the first inner rotating plate (4-4) and the second inner rotating plate (4-5) are hinged to each other through the hinge (4-6); the first inner rotating plate (4-4) is correspondingly provided at an inner side of the first outer rotating plate (4-1); between the first inner rotating plate (4-4) and the first outer rotating plate (4-1), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a first slide rail (4-61), and the other side is provided with a first slider (4-62) that is in a sliding

fit with the first slide rail (4-61); a sliding direction of the first inner rotating plate (4-4) relative to the first outer rotating plate (4-1) is perpendicular to a rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5); the second inner rotating plate (4-5) is correspondingly provided at an inner side of the second outer rotating plate (4-2); between the second inner rotating plate (4-5) and the second outer rotating plate (4-2), one side adjacent to the arc-shaped elastic connector (4-3) is provided with a second slide rail (4-71), and the other side is provided with a second slider (4-72) that is in the sliding fit with the second slide rail (4-71); and a sliding direction of the second inner rotating plate (4-5) relative to the second outer rotating plate (4-2) is perpendicular to the rotation direction of the first inner rotating plate (4-4) relative to the second inner rotating plate (4-5).

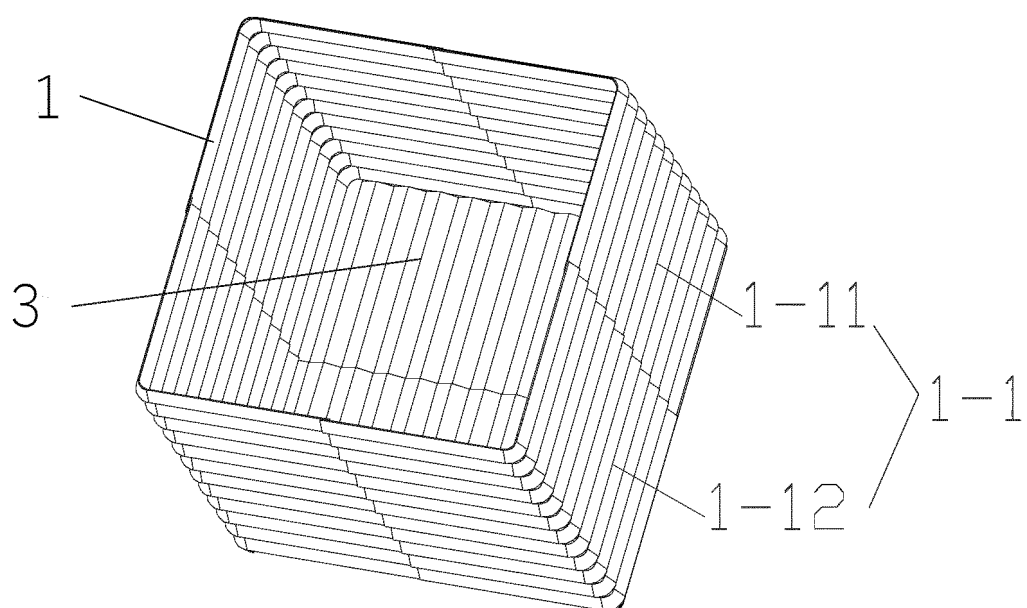


FIG. 1

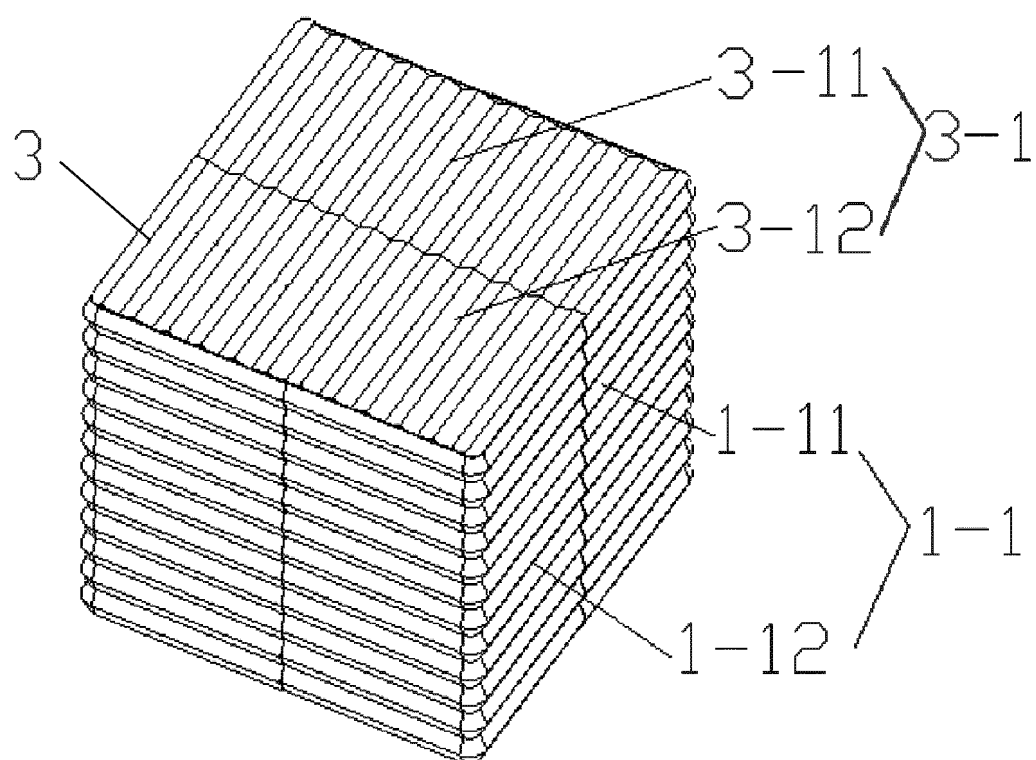


FIG. 2

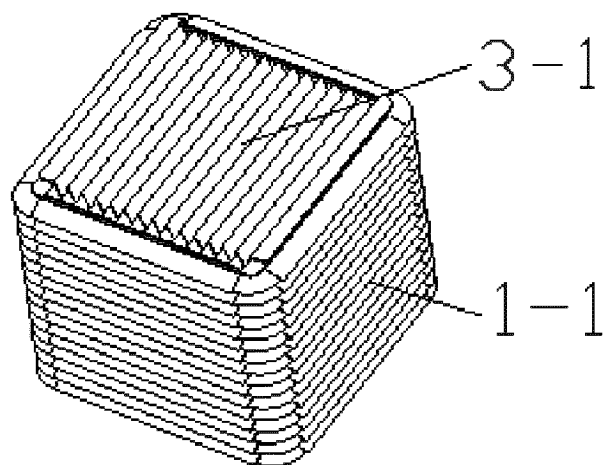


FIG. 3

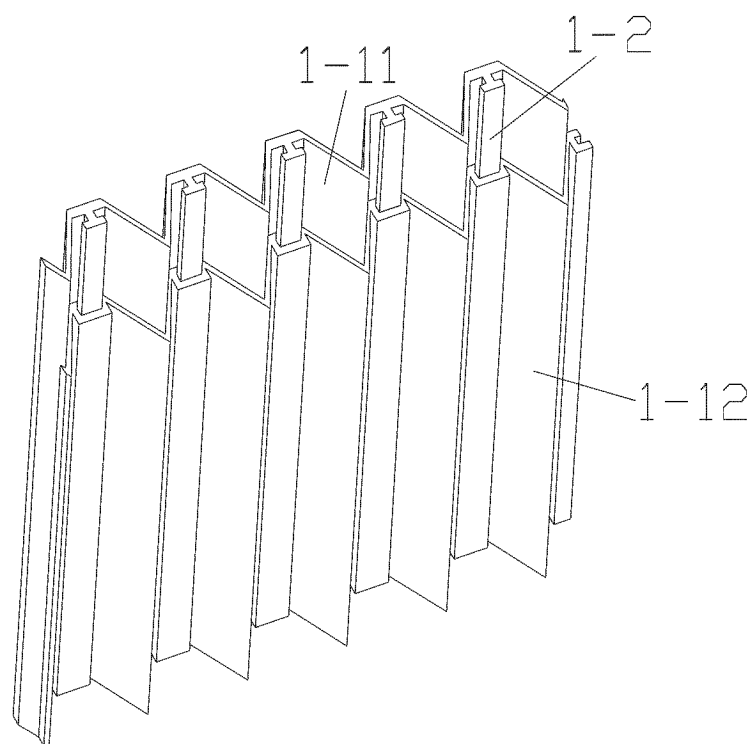


FIG. 4

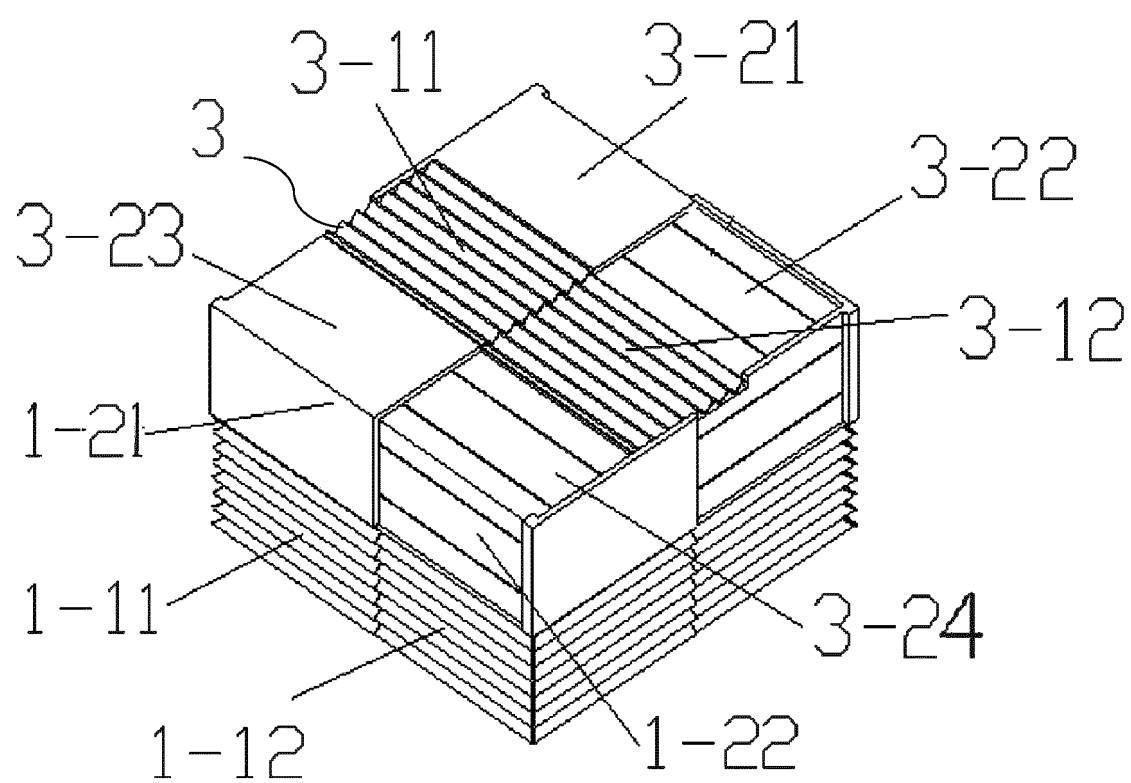


FIG. 5

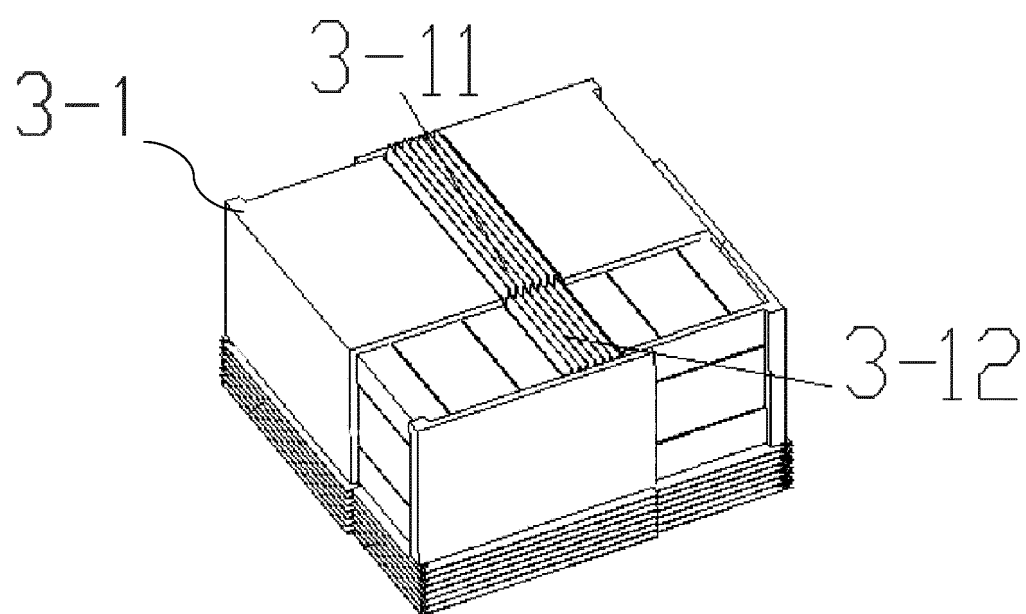


FIG. 6

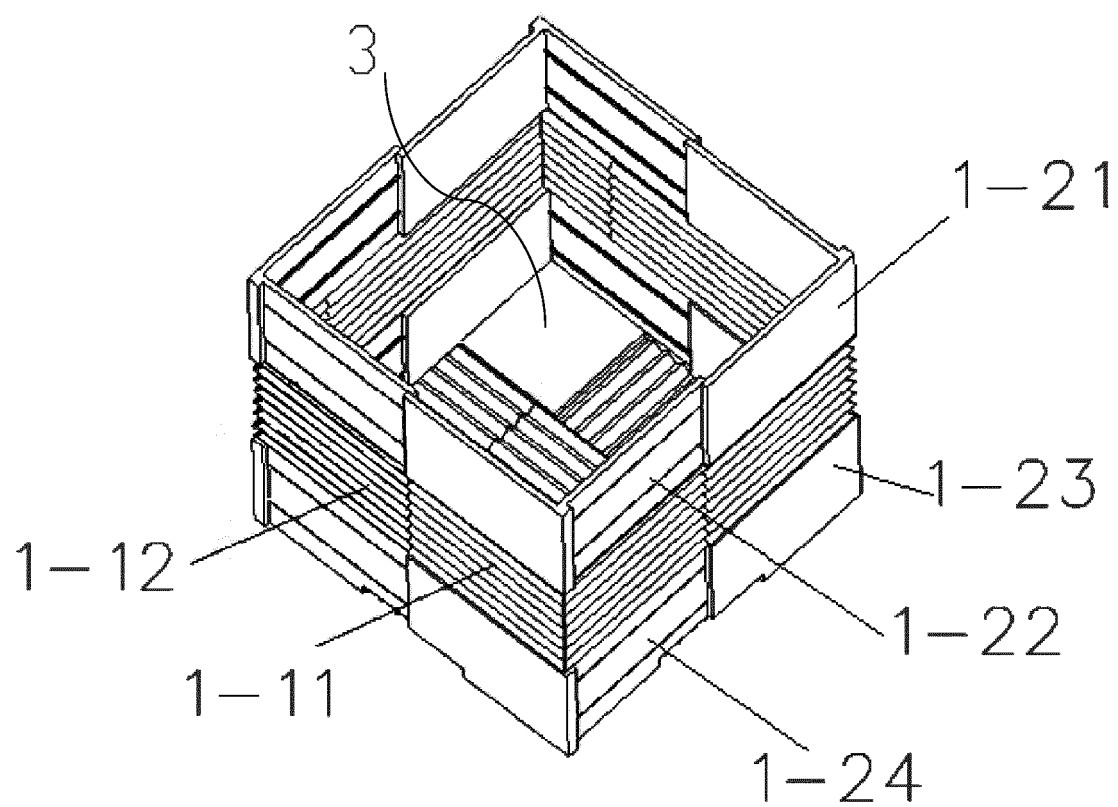


FIG. 7

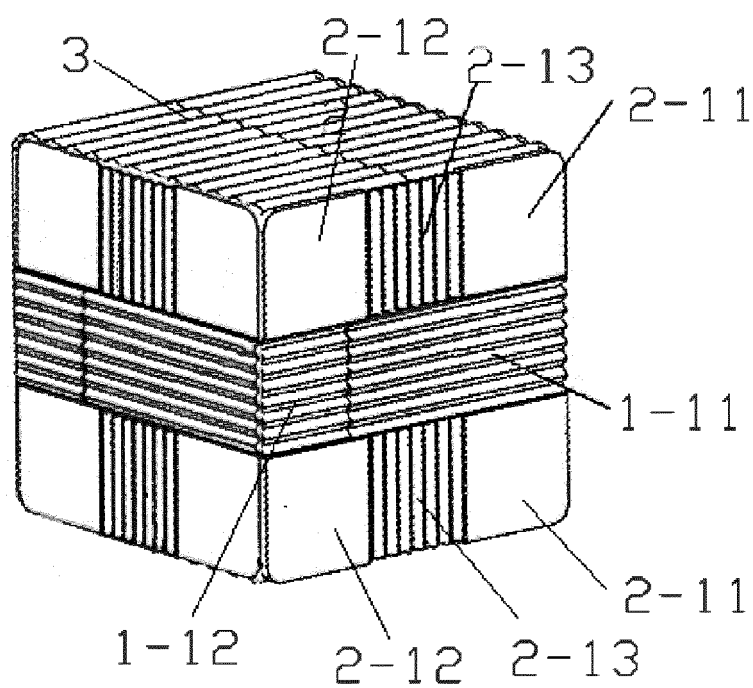


FIG. 8

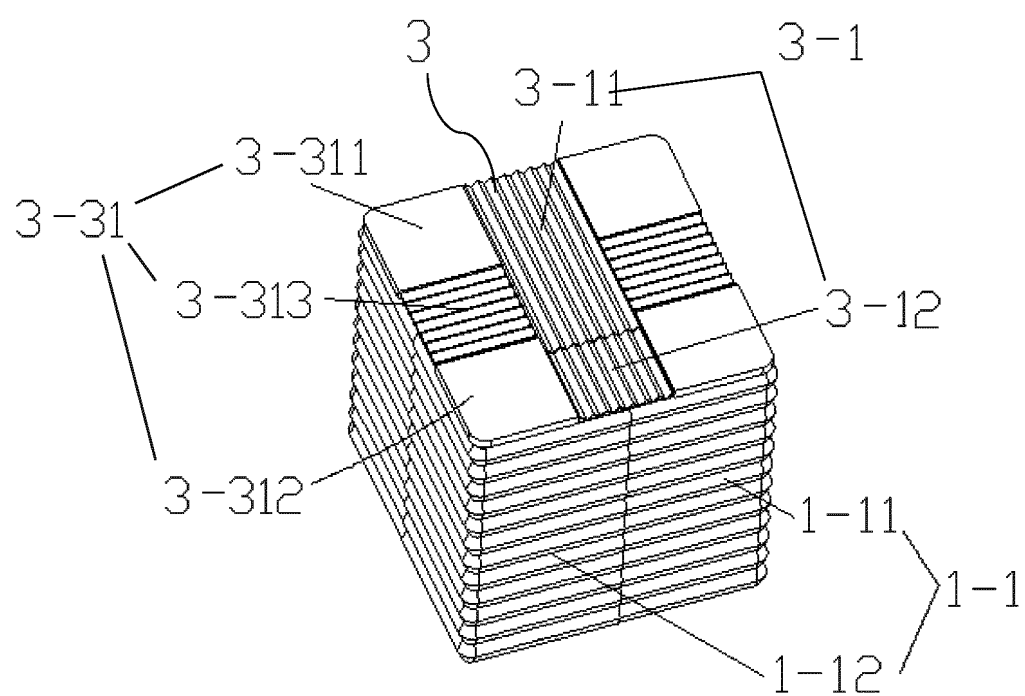


FIG. 9

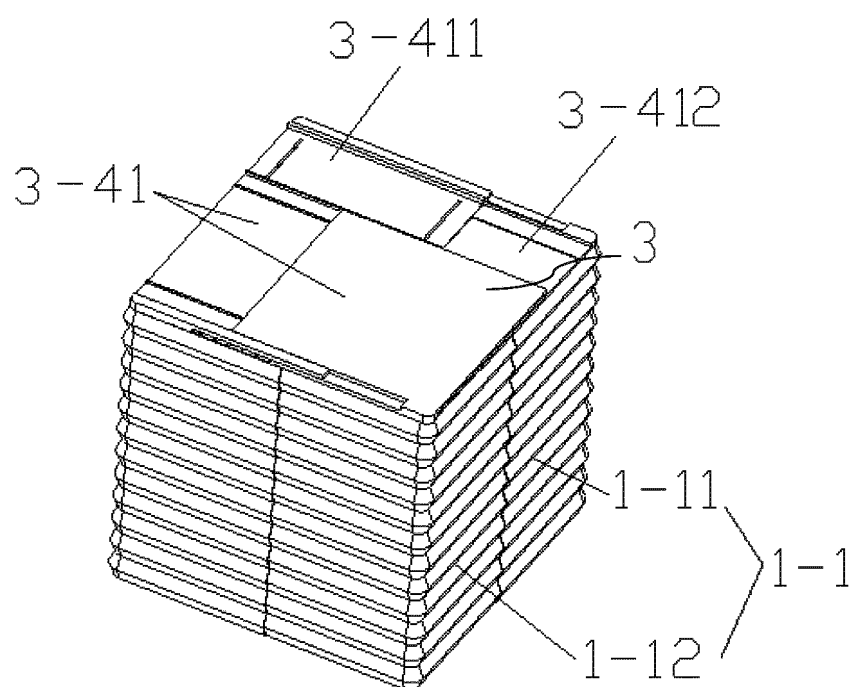


FIG. 10

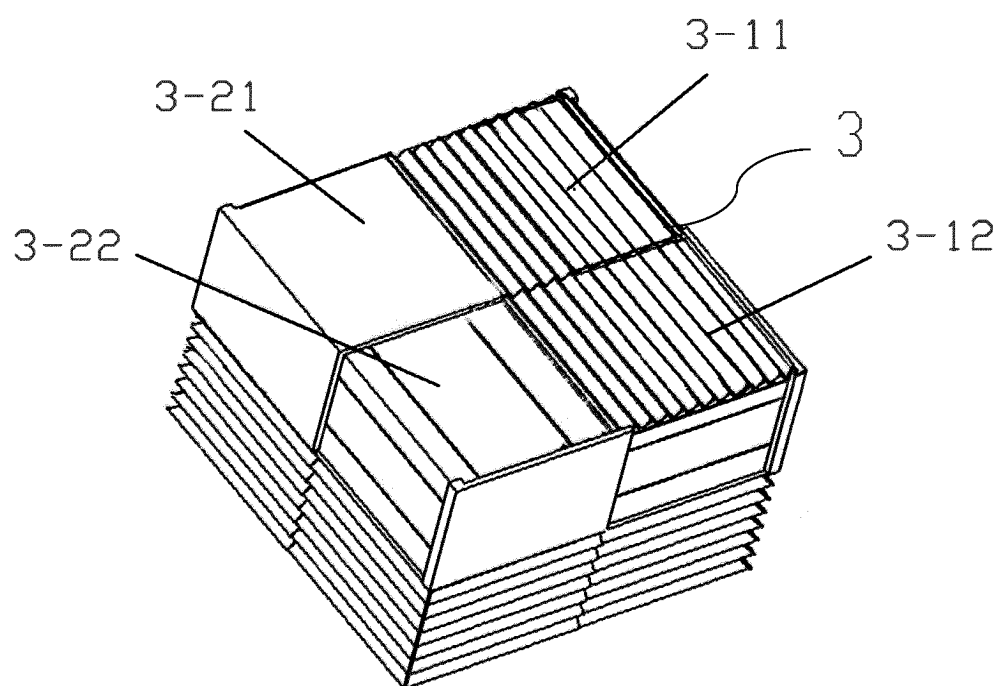


FIG. 11

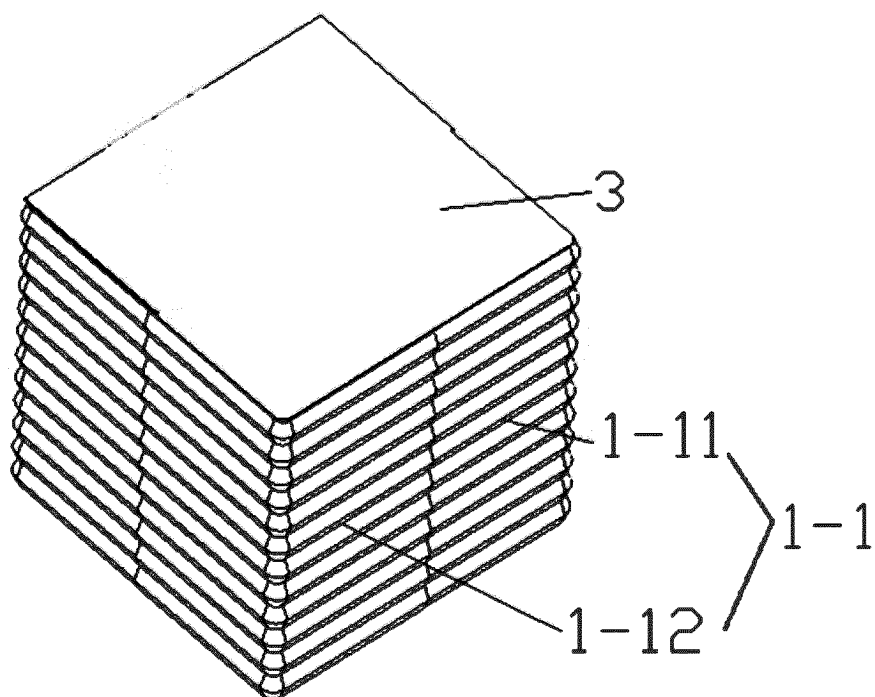


FIG. 12

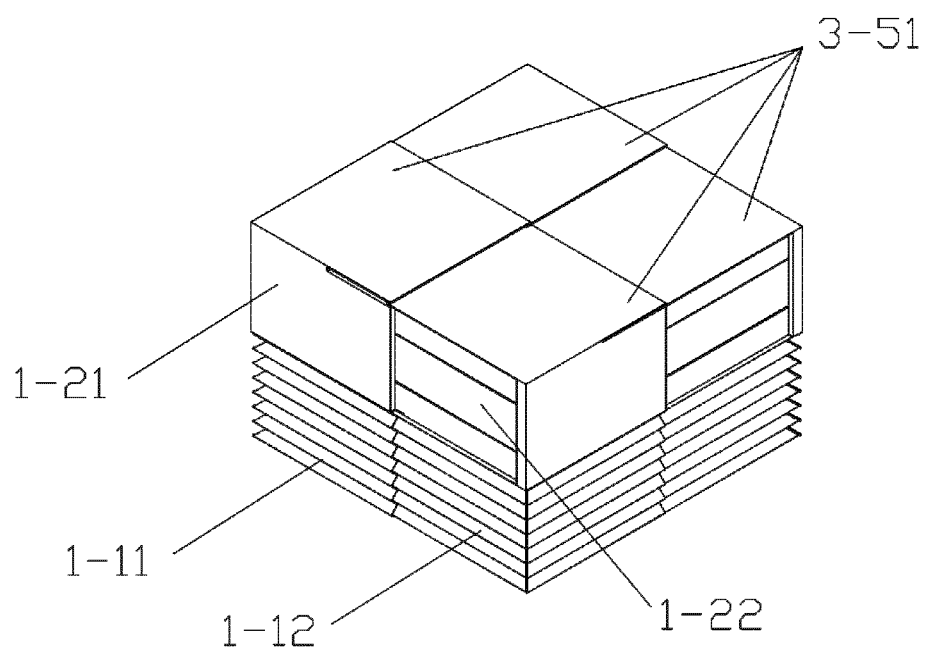


FIG. 13

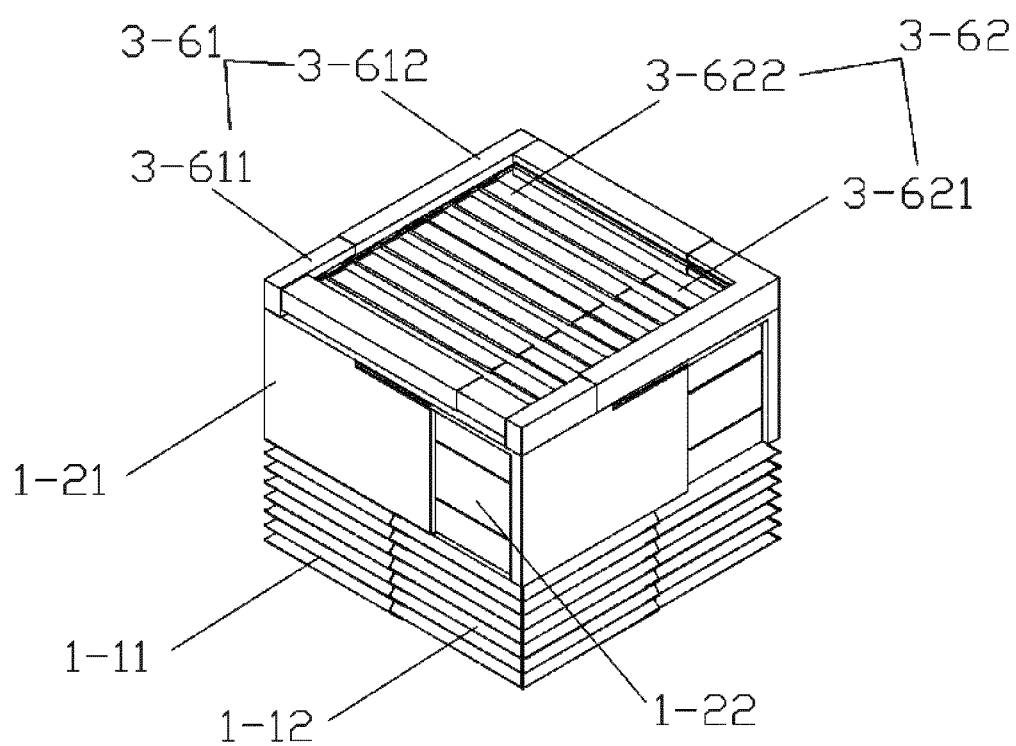


FIG. 14

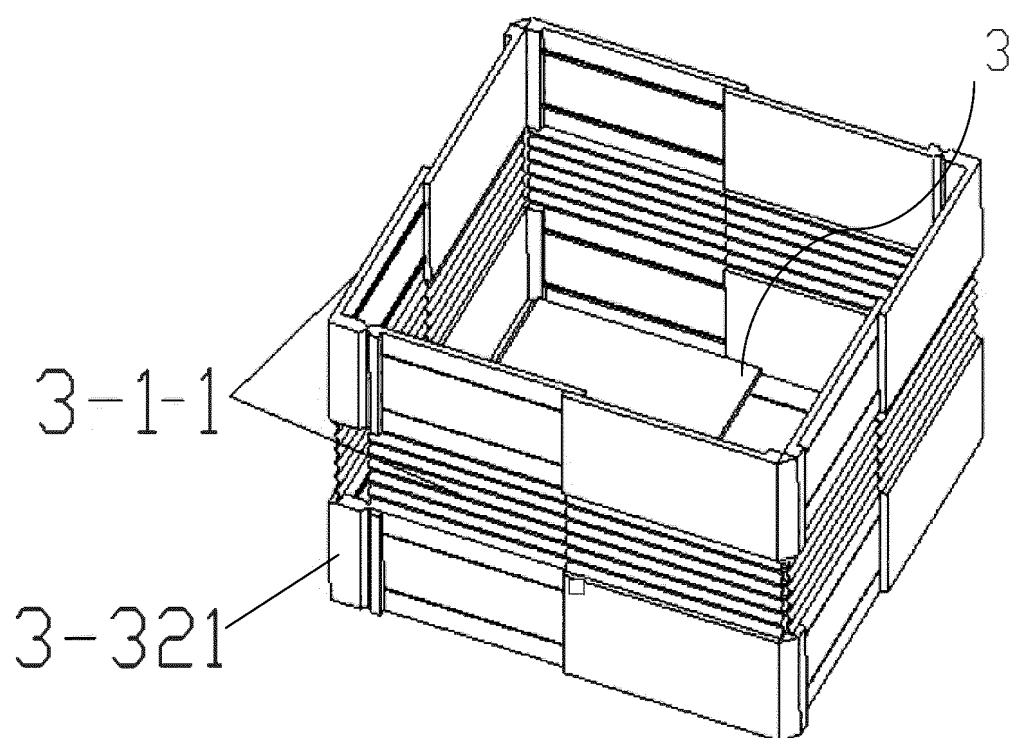


FIG. 15

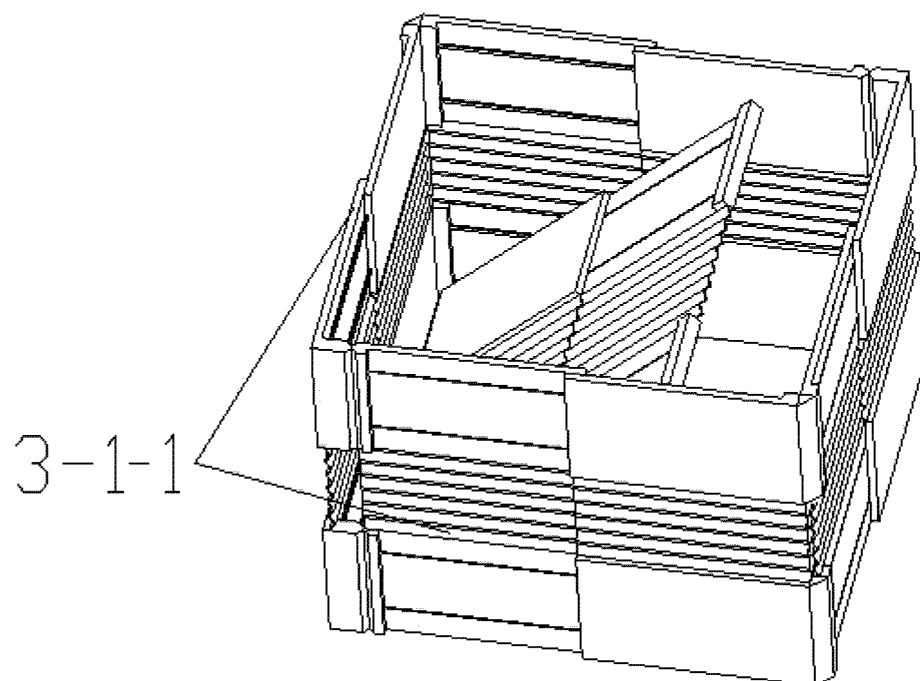


FIG. 16

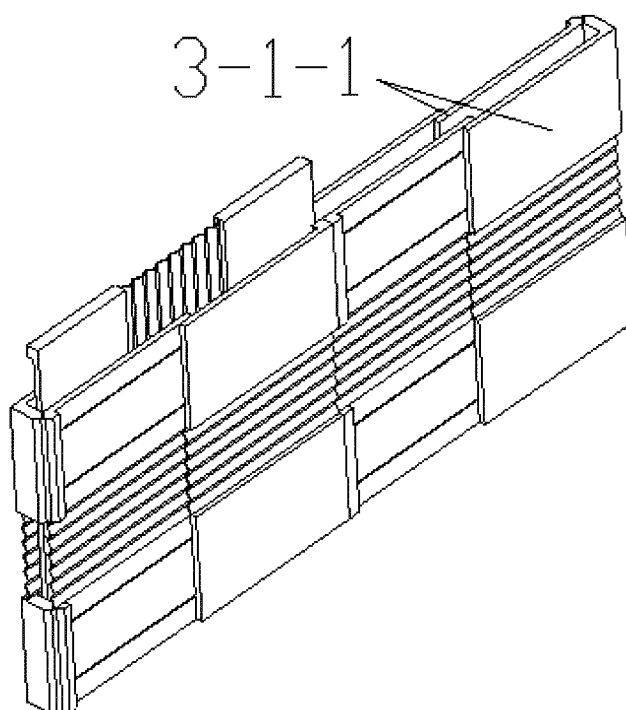


FIG. 17

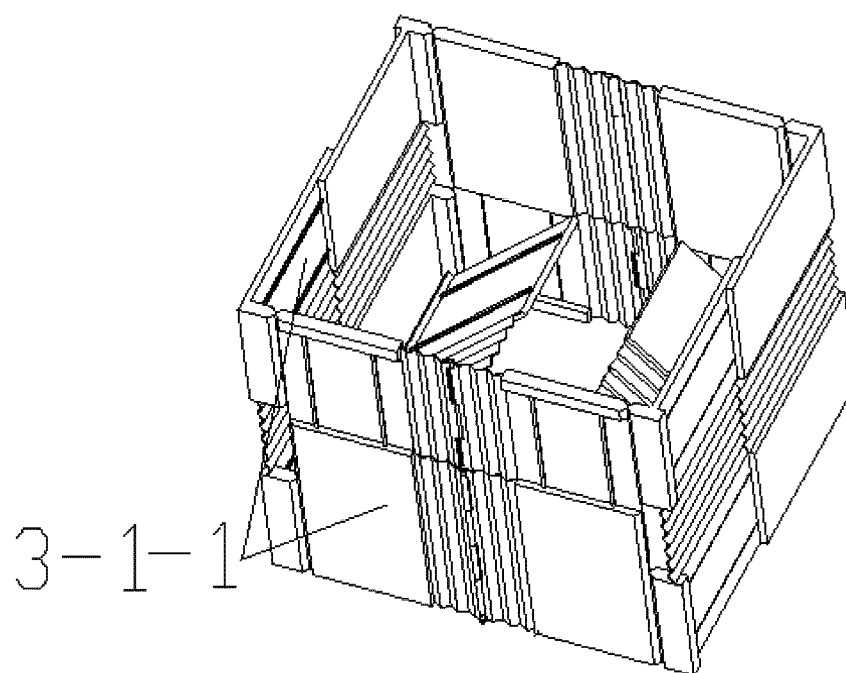


FIG. 18

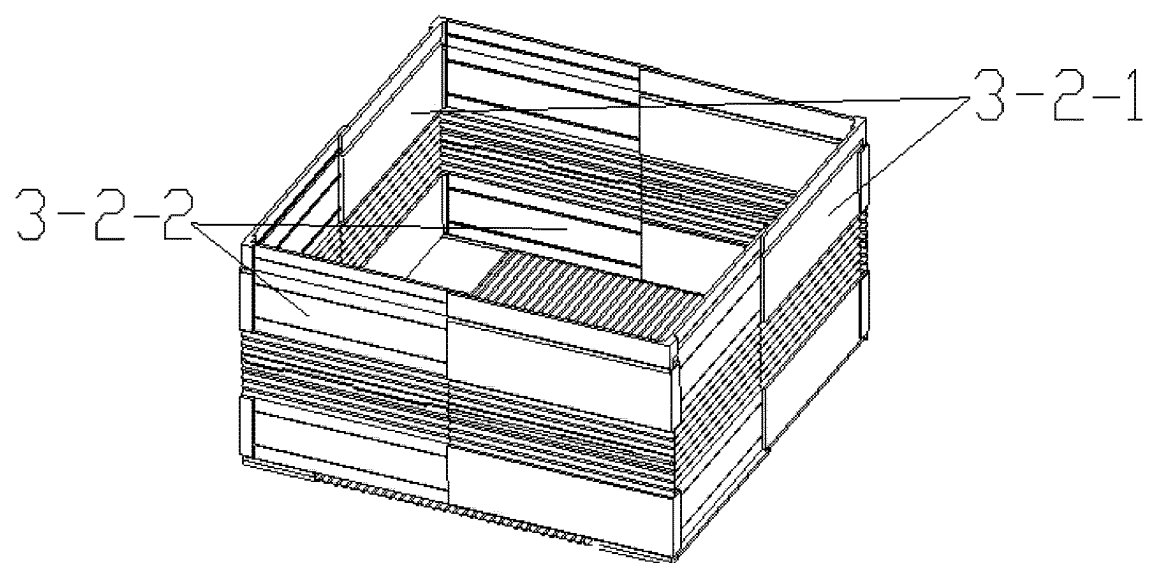


FIG. 19

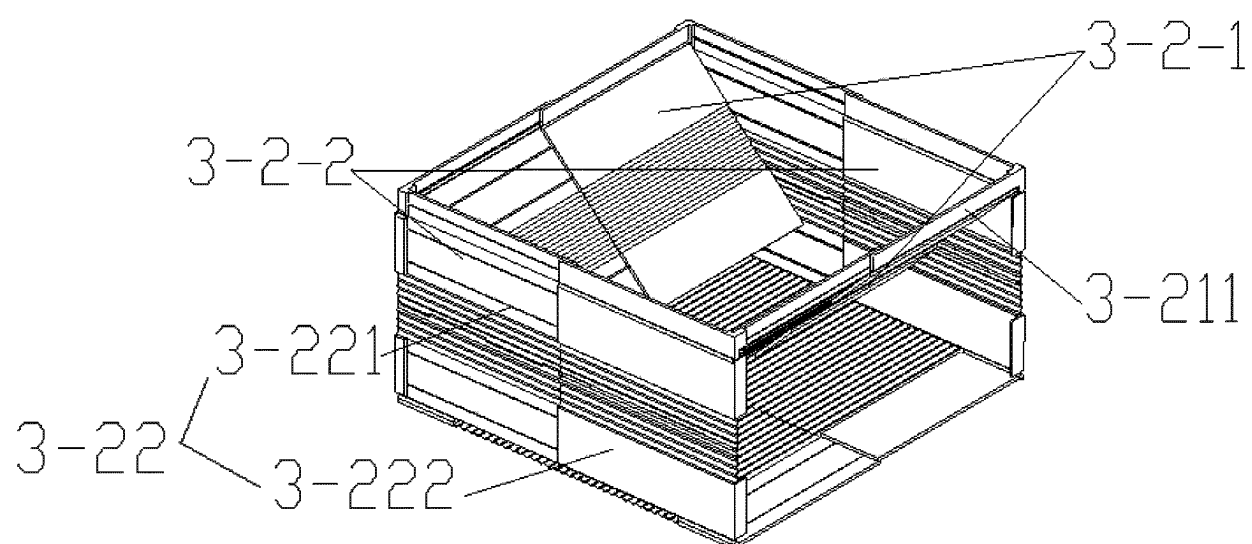


FIG. 20

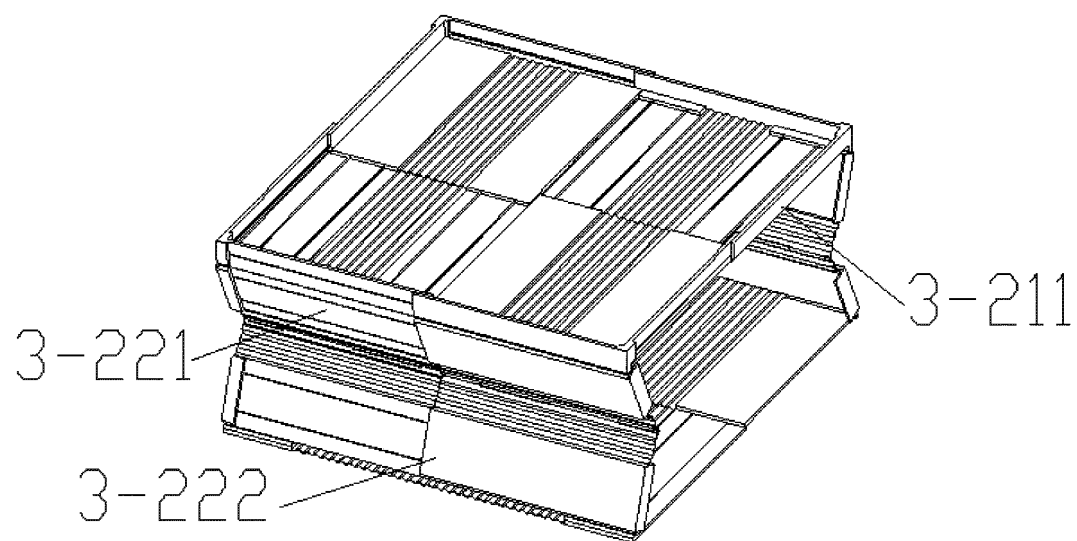


FIG. 21

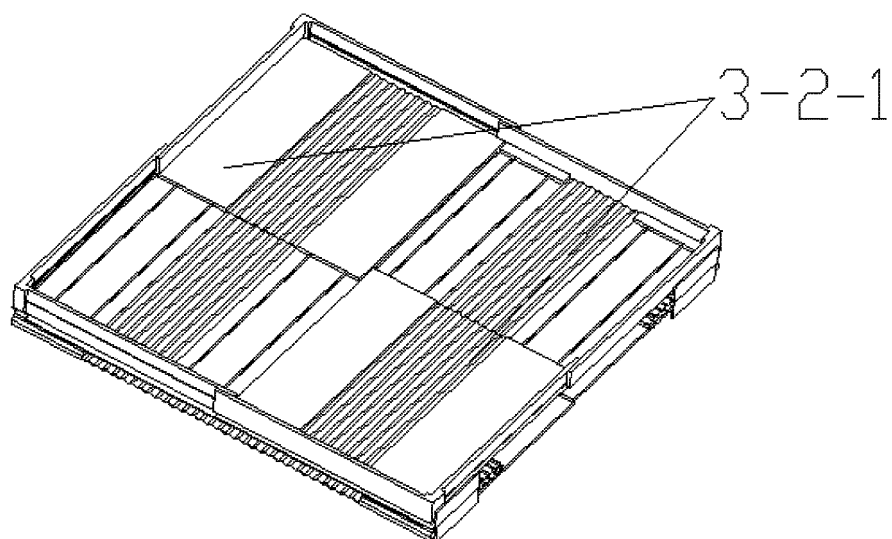


FIG. 22

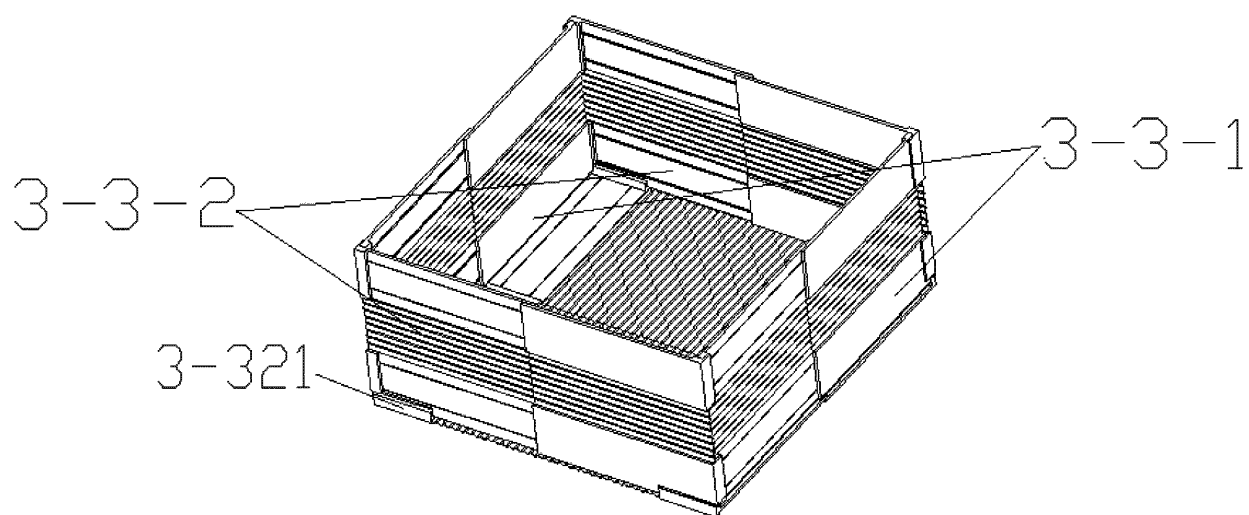


FIG. 23

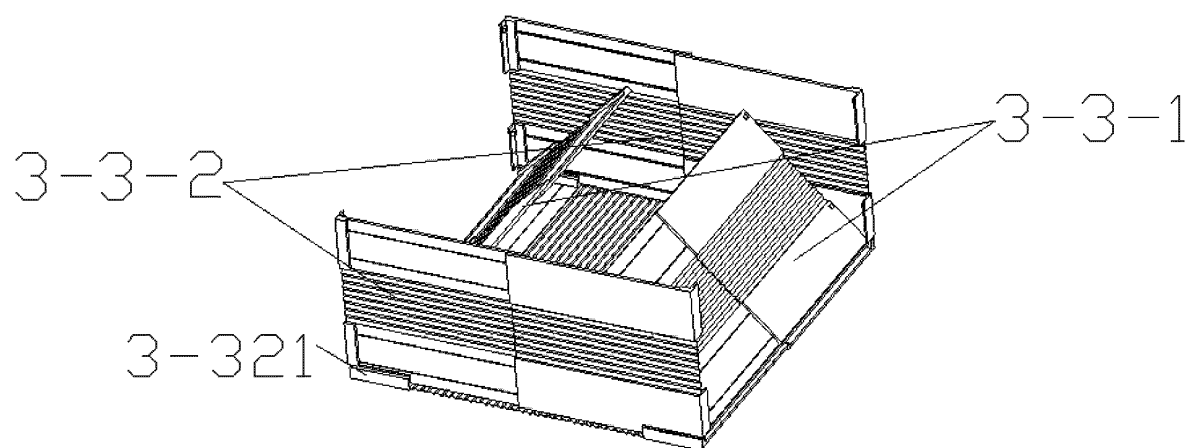


FIG. 24

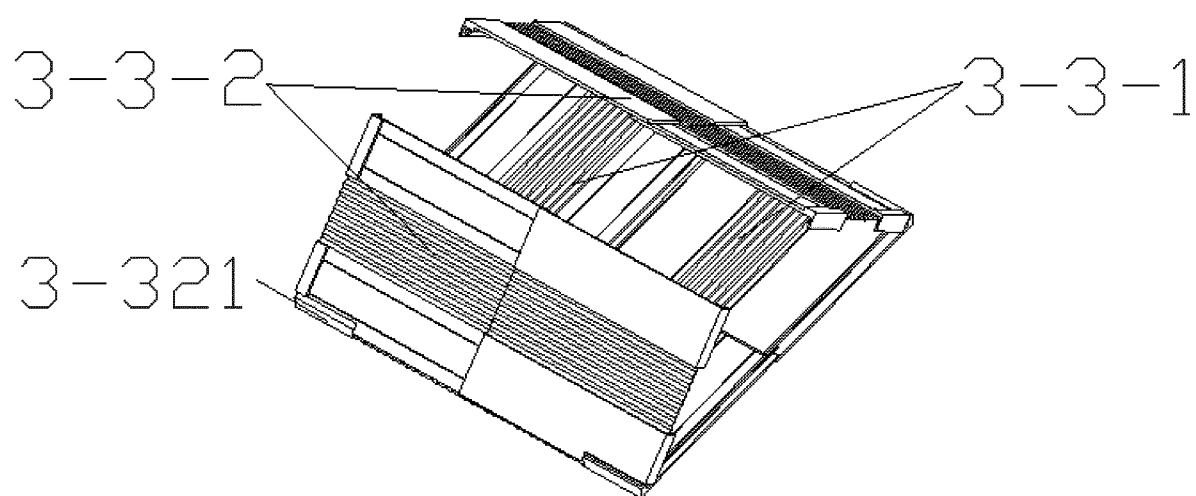


FIG. 25

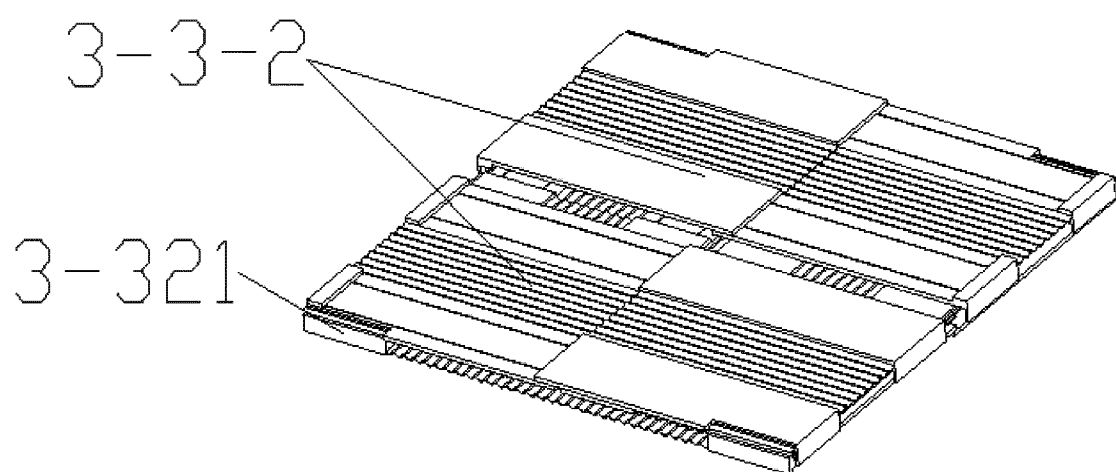


FIG. 26

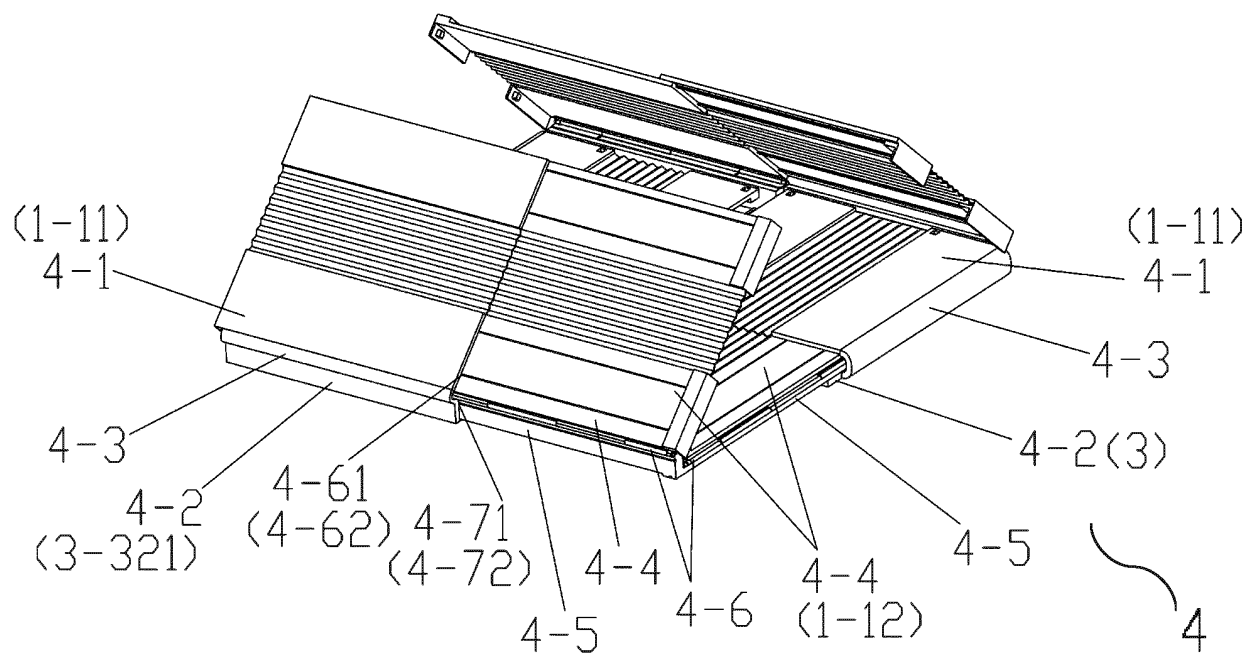


FIG. 27

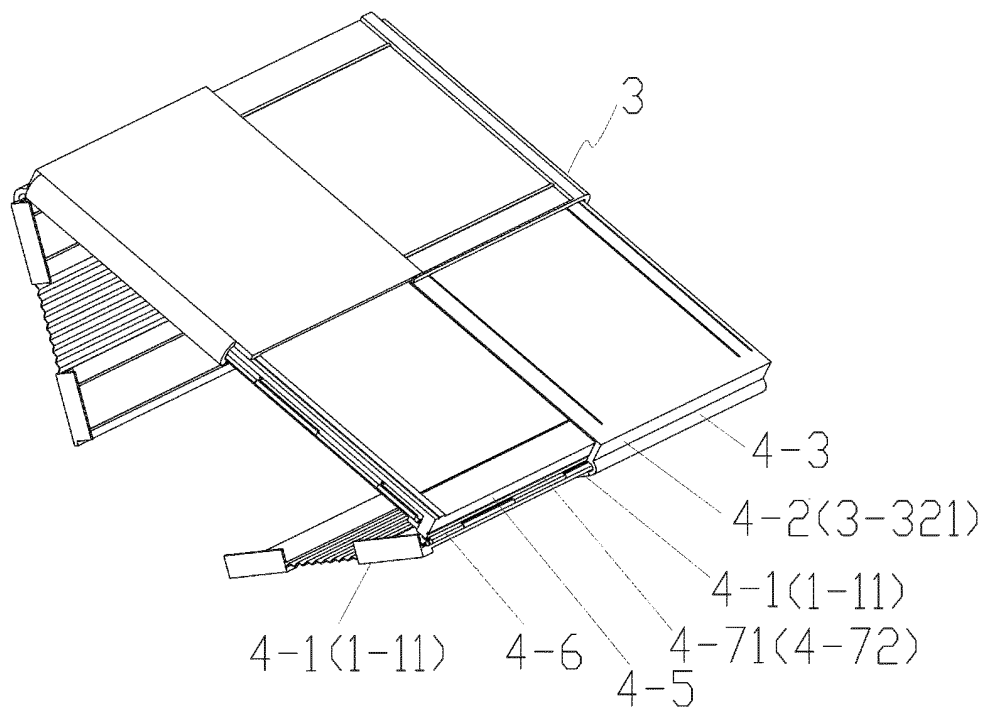


FIG. 28

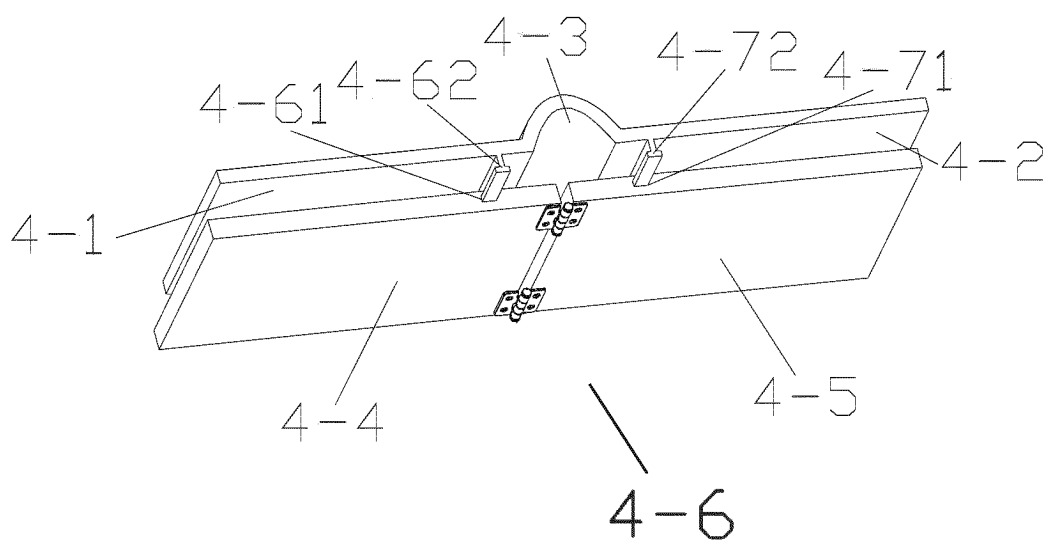


FIG. 29

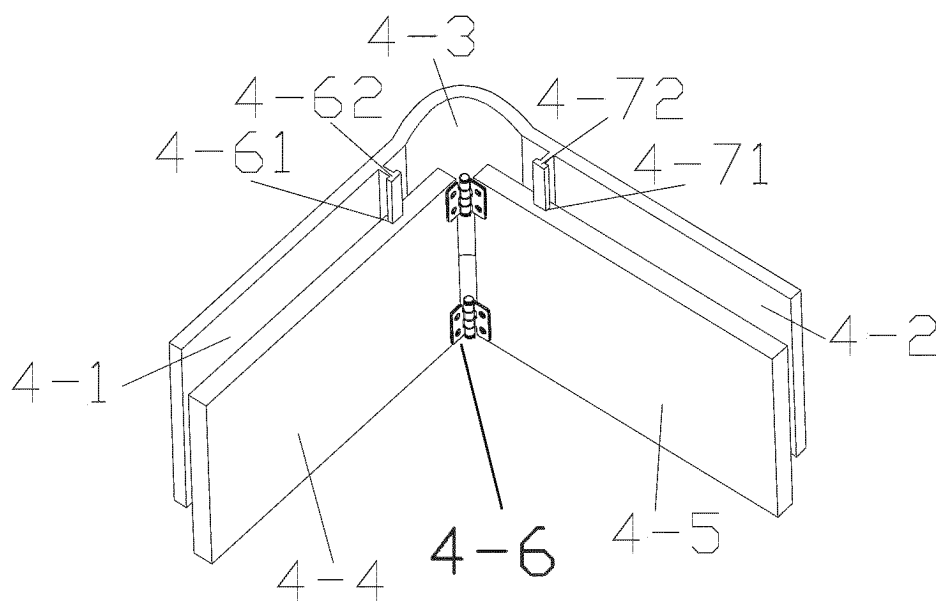


FIG. 30

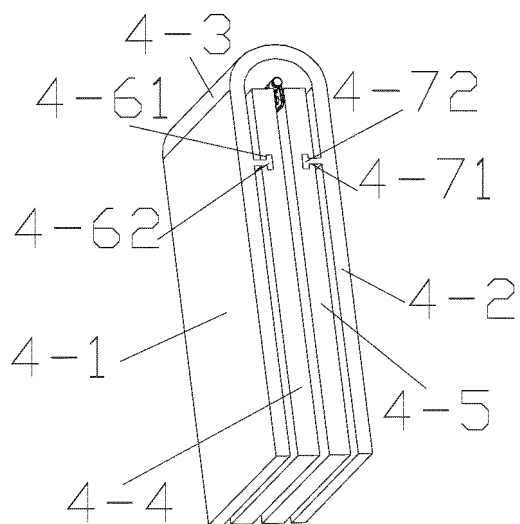


FIG. 31

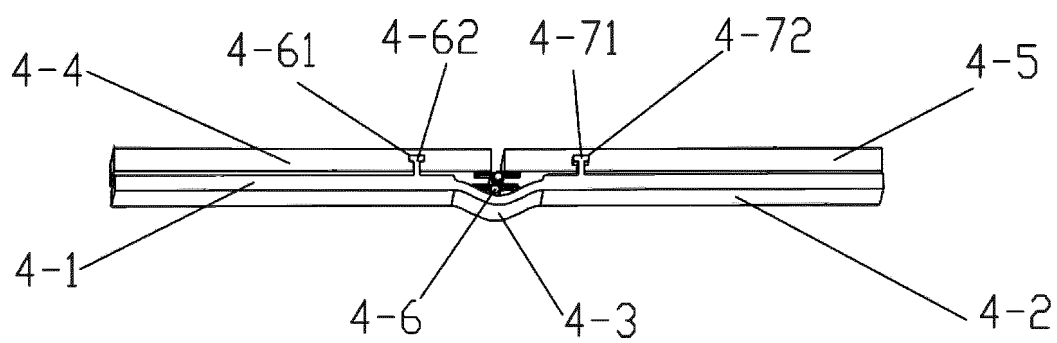


FIG. 32

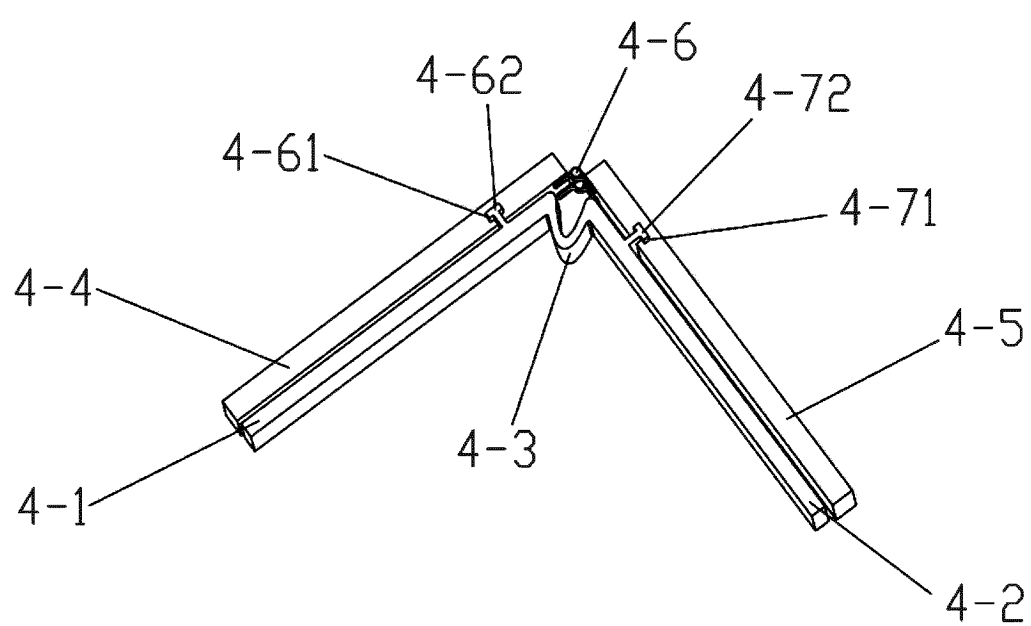


FIG. 33

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/096554

A. CLASSIFICATION OF SUBJECT MATTER

B65D21/08(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, ENTXT, DWPI, CNKI: 收纳箱, 翻折, 折叠, 铰接, 伸缩, storagebox, fold, turnover, hinge, telescopic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 111301822 A (CHEN BOYU) 19 June 2020 (2020-06-19) claims 1-6	1-24
A	CN 111422465 A (YANTAI HEYING CULTURAL INDUSTRY DEVELOPMENT CO., LTD.) 17 July 2020 (2020-07-17) entire document	1-24
A	CN 212448449 U (WUXI DASHUN PACKAGING MATERIALS CO., LTD.) 02 February 2021 (2021-02-02) entire document	1-24
A	CN 216375433 U (TAIZHOU XINGPIN INDUSTRIAL DESIGN CO., LTD.) 26 April 2022 (2022-04-26) entire document	1-24
A	GB 0823324 D0 (ZHU HUIZHEN) 28 January 2009 (2009-01-28) entire document	1-24
A	US 2014139080 A1 (PAN HUILAN) 22 May 2014 (2014-05-22) entire document	1-24

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

17 August 2023

Date of mailing of the international search report

01 September 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)China No. 6, Xitucheng Road, Jimenqiao, Haidian District,
Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/096554

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Patent document cited in search report			Publication date (day/month/year)		Patent family member(s)			Publication date (day/month/year)	
CN	111301822	A	19 June 2020		None				
CN	111422465	A	17 July 2020		WO	2021227799	A1	18 November 2021	
CN	212448449	U	02 February 2021		None				
CN	216375433	U	26 April 2022		None				
GB	0823324	D0	28 January 2009		GB	2466310	A	23 June 2010	
US	2014139080	A1	22 May 2014		None				